Anthrax Outbreaks In Livestock During 1952

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STATISTICAL data on the national incidence of anthrax in livestock, based on nation-wide surveys, have been presented annually from 1945 to 1951[1].

During the seven-year period from 1945 through 1951, there were 1,141 outbreaks reported from 35 states with losses of 11,257 livestock. Outbreaks in new areas were reported from 133 counties in 27 states. In the same period, 29 cases of agricultural anthrax were reported in man, eight of which were in veterinarians.

Data presented in this report are based principally on information furnished the Bureau of Animal Industry by state livestock sanitary officials and Bureau veterinarians in charge of field stations in various states. This report is essentially a summary of figures on incidence of anthrax published in a special report for the first quarter of 1952[2] and in subsequent reports issued monthly by the Bureau at the request of the United States Livestock Sanitary Association. Data compiled from these reports reveal that, during the year, 1,644 anthrax outbreaks in animals were reported from 32 states, involving 432 counties, with a total loss of 1,578 cattle, 20 horses, six mules, 1,614 swine, and 233 sheep. (Tables 1, 2, and map)

Outbreaks in new areas were reported from 289 counties, as follows: One county each in Colorado, Georgia, Kentucky, Louisiana, Montana, Nebraska, New Mexico, North Dakota, and Tennessee; two counties each in Florida, Minnesota, and New York; four counties each in Arkansas and New Jersey; five counties in Missouri; nine counties in Oklahoma; 16 counties in Wisconsin; 17 counties each in Kansas and Michigan; 19 counties in Iowa; 37 counties in Illinois; 38 counties in Texas; 54 counties each in Indiana and Ohio.

A greater number of outbreaks occurred in 1952 than in any single year between 1945 and 1951. (Table 3, graph 1.) In fact, the 1,644 outbreaks in 1952 represented the greatest number ever to be recorded for any single year, and exceeded the total number of outbreaks reported for the seven previous years; however, greater losses of livestock were reported in 1946 due to a severe epizootic in Louisiana.

Tremendous increase in 1952 was brought about by the unprecedented number of outbreaks that occurred during the first two quarters of the year in swine herds in the Midwest and, to the large number of outbreaks during the second and third quarters which followed prophylactic vaccination with certain lots of anthrax bacterin. Mortality rate was low in these outbreaks as compared to instances of infection experienced due to contaminated feed or soil.

Outstanding features of prevalence and distribution of anthrax in 1952 were low incidence in recognized anthrax districts and the occurrence of numerous outbreaks with a low mortality rate in areas that heretofore have reported little or no disease.

Outbreaks in Swine

During the first quarter of 1952, extensive outbreaks of anthrax in swine herds reported from the Midwest received much publicity and created great concern among livestock

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sanitary officials and livestock owners. A survey made by the Bureau covering the first quarter of 1952 indicates that in Illinois, Indiana, Iowa, Michigan, and Ohio, a total of 395 outbreaks occurred, involving 144 counties with losses of 846 swine.

During April, May, and June, 343 additional outbreaks in swine herds were reported in the five states previously mentioned. However, during the third and fourth quarters there was marked decrease in incidence from these areas. The total number of outbreaks for this period was only 63.

Available history and circumstantial evidence in most instances indicated infection in swine in the Midwest to be of food origin. A number of the early outbreaks in swine in Ohio were traced directly to use of mixed feed containing raw bone meal imported from Belgium from which *Bacillus anthracis* was isolated on laboratory examination.

Outbreaks in swine were characterized by the following unusual aspects: (1) Wide distribution, (2) occurrence during winter in noninfected areas, (3) low morbidity and mortality rate, (4) failure to spread from one

Table 1. States Reporting Anthrax Outbreaks in Livestock in 1952 and Data on Incidence.

State	No. counties	No. outbreaks	Losses from Anthrax: Cattle	Swine	Horses and mules	Misc.	Total livestock losses*
Alabama	1	1	1				1
Arkansas	7	13	39		2 horses 3 mules		44
California	10	44	57	27	5 horses	81 sheep	170
Colorado	3	3	2	3			5
Florida	4	12	97		2 horses		99
Georgia	2	4	39				39
Illinois	50	128	16	381		2 sheep 1 dog	399*
Indiana	55	217	4	305			309
Iowa	29	94	31	155			186
Kansas	17	361	509	12	1 horse	127 sheep	649
Kentucky	1	1	2	13			15
Louisiana	8	19	27	2	1 horse		30
Michigan	17	45	33	112		17 sheep	162
Minnesota	4	5	8				8
Mississippi	4	7	5			1 dog	5*
Missouri	10	14	23	18	1 mule 1 horse		43
Montana	1	1		6			6
Nebraska	5	5	5	13			18
Nevada	1	4	6	2			8
New Jersey	8	104	58	6	4 horses	11 mink	68*
New Mexico	3	3	23				23
New York	11	18	17			206 mink	17*
North Dakota	1	1	5				5
Ohio	57	316	18	453			471
Oklahoma	10	10	64	5	3 horses		72
Oregon	1	1	1				1
South Dakota	12	13	14				14
Tennessee	2	2	2		2 mules		4
Texas	77	165	419				419
Utah	2	3	16				16
Wisconsin	18	29	37	40	1 horse	455 mink 6 sheep	84*
Wyoming	1	1		61			61
32 States	432	1644	1578	1614	6 mules 20 horses	233 sheep 2 dogs 672 mink	3451*

*Mink and dogs not included in total livestock losses.

premise to another, and (5) failure to spread by contact from animal to animal, or from swine to other species.

Outbreaks Following Vaccination

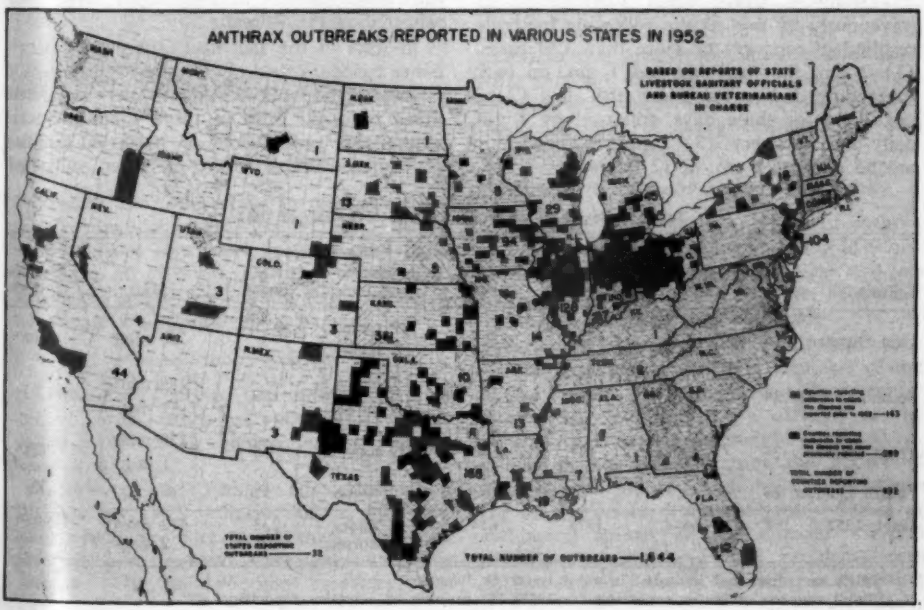
During the early part of May 1952, the Bureau received reports from Kansas that numerous outbreaks of anthrax in livestock were occurring in animals three weeks or more following prophylactic vaccination with a commercial anthrax bacterin. During the period from June to September, reports made to the Bureau indicated that additional outbreaks of similar nature had occurred in Kansas in considerable numbers, and to less extent in New Jersey, Florida, and New Mexico.

During the five months from May through September, a total of 419 outbreaks, involving the loss of 507 animals, was reported in bacterin-vaccinated animals from Kansas, New Jersey, Florida, and New Mexico. Kansas reported 332 outbreaks with loss of 453 animals; New Jersey, 84 with loss of 40; Florida, two with loss of seven; and New Mexico, one with loss of seven.

History associated with post-vaccination outbreaks indicates that reactions occurred in a high percentage of the herds of cattle or flocks of sheep vaccinated with specific lots of anthrax bacterin. In vaccinated groups of animals that developed reactions following injection of the bacterins in question, the number that developed symptoms of anthrax varied from 1 to 50% or more. Following administration of bacterin, a period of three to eight weeks, or longer, elapsed before animals exhibited symptoms; the average time was approximately 30 days.

Symptoms

In cattle and horses, swellings of varying sizes developed at or near the site of injection accompanied by rise in body temperature, inappetence, and general depression. There was marked decrease in milk secretion in affected dairy cows and abortions occurred in a number of animals. In some instances, edematous swellings were extremely large, involving the shoulder and leg and extending to the region of the sternum and along the ventral abdominal wall. Because of pronounced swellings, the condition in some instances was first mistaken for anaerobic infection or snake bite. In later stages of the disease, in some cases, there was bleeding from natural openings. Animals showing extensive edematous swellings presented a typical picture of so-called cutaneous or external anthrax (fig. 1). In cattle and horses, the disease usually ran a subacute course, while in affected sheep it was acute and fatal. An organism with cultural characteristics of *B. anthracis* was isolated from blood and tissue specimens of a number of affected animals that died.


ANTHRAX OUTBREAKS REPORTED IN VARIOUS STATES IN 1952
BASED ON REPORTS OF STATE LIVESTOCK SANITARY OFFICIALS AND BUREAU VETERINARIANS IN CHARGE
TOTAL NUMBER OF OUTBREAKS—1,644

Treatment

Many affected animals recovered where treatment with antibiotics and antiserum was started when symptoms were first observed; however, symptoms recurred in some affected animals that made apparent recovery following treatment.

In most cases, administration of large doses of penicillin and anthrax antiserum was required to effect a cure. For example, in Kansas, excellent results were obtained in many instances when 6,000,000 units of penicillin were administered intramuscularly the first day, 3,000,000 the second day, and 3,000,000 the third day, together with 150 cc. or more of antiserum given intraperitoneally on the first day.

Dr. W. W. Bailey of Sussex, New Jersey,[3,4] reported successful treatment of at least 150 cases of vaccine anthrax when one of the following methods of treatment was administered: (1) Penicillin alone, (2) penicillin in combination with terramycin, and (3) terramycin alone. Cases, when treated in early stages, recovered after receiving 3,000,000 to 6,000,000 units of aqueous penicillin. A number of cases with more advanced symptoms were successfully treated with terramycin intravenously, 2 gm. as an initial dose and 1 gm. daily for two to three days supported by penicillin intramuscularly in doses up to 6,000,000 units.

Terramycin alone, when administered intravenously by one of the following methods, resulted in recovery of more than 170 cases: (1) 2 gm. the first day and 1 gm. on each succeeding day to fourth or fifth day; (2) 2 gm. daily for three days, followed by 1 gm. daily until recovery; (3) 2 gm., followed by a second dose of 2 gm. in 12 hours.

Photo courtesy Dr. I. P. Coulter

Fig. 1. Symptoms of so-called external or cutaneous anthrax following prophylactic vaccination. Note edematous swelling in the region of shoulder, brisket, and ventral portion of the abdomen.

A number of the affected animals in herds in Florida and New Mexico that reacted following vaccination with the serials of bacterin in question, likewise recovered following treatment with penicillin.

On investigation, it was found that four serials of bacterin were involved. All unused portions of these particular lots which were in the hands of distributors and veterinarians were immediately recalled and destroyed under government supervision.

It should be pointed out that such formalized anthrax bacterins have been produced for more than 20 years under government license and that this is the first instance in which unsatisfactory results of this nature have been reported to the Bureau.

In spite of the fact that circumstantial evidence based on field observations indicates that postvaccination outbreaks in widely separated areas occurred only in those animals vaccinated with certain lots of bacterin, samples of bacterin under suspicion, when subjected

Table 2. Incidence of Anthrax for Each Quarter of 1952.

Period	No. states reporting	No. outbreaks	Livestock Losses Cattle	Swine	Horses and mules	Sheep	Misc.	Total livestock losses*
First Quarter	15	606	513	892	1 mule 2 horses		336 mink	1408*
Second Quarter	24	676	618	491	5 mules 5 horses	152	186 mink 1 dog	1271*
Third Quarter	26	303	378	168	12 horses	66	150 mink 1 dog	624*
Fourth Quarter	18	59	69	63	1 horse	15		148
Total, 1952	**	1644	1578	1614	6 mules 20 horses	233	672 mink 2 dogs	3451*

*Mink and dogs not included in total livestock losses.
**Total number of states reporting for 1952: 32; number of counties reporting: 432.

to bacteriological examination four weeks or more after they had first been used in the field, failed to reveal presence of viable anthrax organisms.

Outbreaks in Mink

During the year, seven outbreaks were reported in minkeries. Wisconsin reported four, with total loss of 455 animals; New Jersey, one with loss of 11; and New York, two with loss of 206. Source of these outbreaks was traced to feeding mink meat from animals that died of anthrax. Such meat should never be used as feed. It should be emphasized also that the entire carcasses of mink that die should be destroyed by burning or deep burial in quicklime. Since at present no effective and practical method is known for sterilizing mink pelts contaminated with anthrax spores, no attempt should be made to salvage pelts from animals that die from the disease.

Photo courtesy Dr. I. P. Coulter

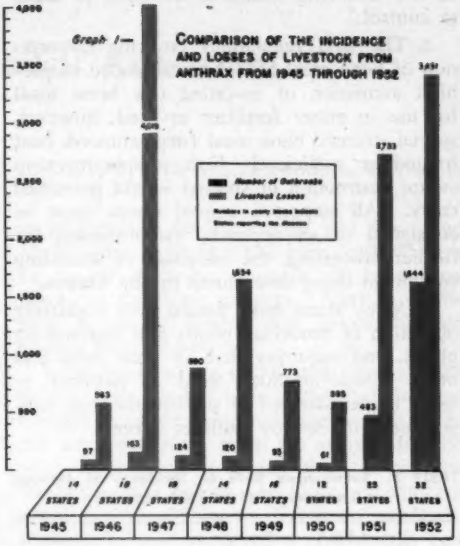
Fig. 2. Diagnosis: Vaccination anthrax. Note edema in neck and brisket areas.

Prior to 1952, outbreaks in mink were reported from Colorado, Missouri, and Oregon in 1939, from New York in 1941, and from Wisconsin in 1951[3,5]. During two of these outbreaks, employees of minkeries acquired the disease while removing pelts.

Miscellaneous Reports

Puerto Rico reported two outbreaks with a loss of seven cattle; no outbreaks were reported from Alaska, Hawaii, or the Panama Canal Zone.

Records of the Federal Meat Inspection Division for 1952 indicate that at establishments operating under federal meat inspection, 195 hogs and no cattle were condemned for anthrax. Of the 195 hog carcasses condemned, 178 were detected on postmortem examination during the first six months of 1952.



Records of the U. S. Public Health Service for 1952[6] give a preliminary total of 42 cases of anthrax in man.

In California, one case in a veterinarian who contracted the disease from conducting post mortem on an anthrax-infected cow was reported. In Ohio, one laboratory worker accidentally acquired the infection during the outbreaks in that area from handling specimens from infected animals, and a carpenter engaged in repairing bins used for holding bonemeal suspected of being contaminated also acquired the disease.

Action to Prevent Future Outbreaks

Numerous widespread outbreaks of anthrax in 1952 caused great concern among livestock sanitary and public health officials and resulted in their taking special action to combat the disease and prevent its spread.

Following experience with swine herds during the first quarter of 1952, members of the U. S. Livestock Sanitary Association, representing 16 states, met with officials of the U. S. Department of Agriculture, the U. S. Public Health Administration, the Food and Drug Administration, and the Civil Defense Administration to discuss ways and means of combating spread of the disease. Several resolutions concerning the problem were passed at this meeting, resulting in adoption

of the following measures designed to assist in control:

1. The BAI regulations covering importation of bone meal have been amended to prohibit admission of so-called raw bone meal for use in either fertilizer or feed; however, special steamed bone meal (degelatinized, heat treated at sufficiently high temperatures to assure destruction of spores) is still permitted entry. All imported animal bones must be consigned to an approved establishment for further processing, the adequacy of sterilizing equipment being determined by the Bureau.

2. Many states have passed laws regulating operation of rendering plants and feed-mixing plants, and requiring that all bone meal and other animal products used in fertilizer or feeds be heat-treated at sufficiently high temperatures to destroy anthrax spores.

TABLE 3. Summarized Data on Incidence of Anthrax in Livestock, 1945 to 1952 Inclusive

Year	No. states reporting	No. counties involved	No. outbreaks	Livestock losses*
1945	14	52	97	583
1946	18	82	163	4019**
1947	19	65	124	880
1948	14	63	120	1654**
1949	16	57	93	773
1950	12	55	61	595
1951	25	113	483	2753
1952	32	432	1644	3451

*In some states losses were estimated.
**Heavy losses were reported during severe epizootics of the disease in Louisiana.

3. The U. S. Public Health Service, with the assistance of the U. S. Bureau of Animal Industry, the Federal Food and Drug Administration, and the Federal Civil Defense Administration has prepared specific regulations endorsed by cooperating agencies in relation to anthrax in dairy herds. These have been recommended for inclusion in the Milk Ordinance and Code of the U. S. Public Health Service as applied to anthrax. They have also been approved by the U. S. Livestock Sanitary Association. Copies of these recommendations were sent to all state and territorial milk control authorities and others concerned on February 4, 1953.

4. In order to have up-to-date information on prevalence and distribution of the disease in livestock, arrangements have been made to have each state report monthly to the Bureau all outbreaks of anthrax occurring within its boundaries so that the Bureau can, in turn, issue a monthly report on national incidence.

5. Special committees on anthrax have been appointed by the U. S. Livestock Sanitary Association and the American Veterinary Medical Association to study the anthrax problem and make recommendations for its future control.

Summary

Results of a nation-wide survey to determine incidence of anthrax in livestock in 1952 indicate that 1,644 outbreaks in livestock were reported from 32 states involving 432 counties, with a total loss of 3,451 animals. The tremendous increase in outbreaks was due principally to an unprecedented number occurring in swine herds in the Midwest and to the large number following prophylactic vaccination with certain lots of anthrax bacterin.

Outstanding features of the prevalence and distribution of anthrax in 1952 were its low incidence in recognized anthrax districts and occurrence of numerous outbreaks, with low mortality rates, in areas that heretofore reported little or no disease.

During 1952, Wisconsin reported four outbreaks in minkeries with total loss of 455 animals; New Jersey, one with a loss of 11; New York, two with a loss of 206.

Records of the Federal Meat Inspection Division for 1952 indicate that, at establishments operating under federal meat inspection, 195 hogs and no cattle were condemned for anthrax lesions.

Measures adopted by livestock sanitary and public health officials for the prevention and future control of anthrax in livestock are enumerated.

REFERENCES

1. Stein, C. D., and Stoner, Margaret G., Anthrax in Livestock During 1951 and Comparative Data on the Disease from 1945 through 1951. *Vet. Med.*, 47:315 (Aug.), 1952.

2. Stein, C. D., and Stoner, Margaret G., Anthrax in Livestock During the First Quarter of 1952 with Special Reference to Outbreaks in Swine in the Midwest. *Vet. Med.*, 47:274 (July), 1952.

3. Conference on Anthrax and Foot-and-Mouth Disease, Proc. 89th Ann. Mtg. Am. Vet. Med., Assn., Atlantic City, N. J., June 23-26, 1952.

4. Bailey, W. W., Terramycin vs. Anthrax—A report of over 170 cases. *Antibiotics News and Notes*, Pfizer Veterinary Department, Antibiotic Division, Vol. 1 (Aug.), 1952.

5. Stein, C. D., The History and Distribution of Anthrax in Livestock in the United States. *Vet. Med.*, 40:340 (Oct.), 1945.

6. *Morbidity and Mortality Weekly Report*, Vol. 1 (Jan.), 1953, Federal Security Agency, Public Health Service, National Office of Vital Statistics.

Comparison Of Treatments For Anestrum In Dairy Cattle

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VETERINARIANS engaged in treatment of infertility in dairy cattle recognize anestrum as one of the problems which is frequently presented. Bhattacharya, *et al.*,[1] Cameron,[2] Folley and Malpress,[3] and others have discussed methods of treatment. Several methods which have been introduced are manual expulsion of the corpus luteum, injection of gonadotropins, and injection of estrogens. In cattle, manual expression of the corpus luteum and use of estrogens have been most widely practiced. This is especially true when the apparent cause of anestrum is said to be retained corpus luteum. The most commonly used estrogenic substance is diethylstilbestrol; however, recently other potent estrogenic substances such as estradiol cyclopentylpropionate (E.C.P.)®[1] have been introduced.

Anestrum is of concern at two periods in the reproductive cycle. First, some cows remain in a sexually quiescent state for indefinite periods following parturition; and second, others develop persistent anestrum after one or more services. Cows of the latter category are more common. The writer has recorded 1,403 examinations for pregnancy made between the 60th and 75th day following service. Of these, 14.11% were open, but no estral period had been reported. This figure seems to agree fairly well with that of Barret *et al.*[4] who found a discrepancy of 16% in conception rate when pregnancy examinations were compared with 30 to 60 day non-return rates. In their work, they found that discrepancy decreased to 4.4% if 90 to 120 day non-returns were compared.

Materials and Methods

All observations included in this report were made in herds where artificial insemination was being practiced. Data were accumulated over a five-year period for the specific purpose of determining the most satisfactory method for handling anestrum. An attempt was made to vary treatments at random.

In this study, a cow was classified as anestrous if not in estrum for a period of 60 days or longer since the last service, and was found open. Also, cows that had been fresh 90 days or longer with no evidence of heat were placed in the same category. Various herdsmen in several dairies were responsible for finding cows in heat.

Data presented were collected from six different herds. It has been found that the percentage of anestrous cows in the various herds did not vary greatly from the average for the total. Therefore, it is felt that the various herdsmen were equally capable of recognizing estral manifestations. From an academic standpoint, some of the cows undoubtedly had short or mild periods. However, since they had been missed for three consecutive cycles they must be classified as anestrous for all practical purposes.

The cows were treated in four groups: Group I served as a control; these cows were examined, but received no treatment. Group II consisted of cows in which a corpus luteum was expelled from the ovary by manual manipulation; in a few of these, cysts were also found and ruptured. Group III consisted of cows in which stilbestrol was given in doses of 25 to 50 mg.; group IV consisted of cows which received estradiol cyclopentylpropionate (E.C.P.) in 6 mg. doses. The author has used various gonadotropic substances, but only in special cases and not in great enough frequency to offer comparisons.

Results

Results of these treatments have been compared from the standpoint of early occurrence of estrum and conception. Instructions were to bring cows in for breeding on the first observed heat after treatment.

Table I shows the influence of four treatments on induction of estrum. Although E.C.P. has not received as wide usage as other methods of treatment, there was a marked superiority over other methods. Estrum occurred in from one to 18 days after treatment. Of the two animals which had not developed signs by the tenth day, one showed estrum on the 11th day and the other on the 18th. Estrum produced with E.C.P. was stronger as a

[1]The Upjohn Company, Kalamazoo, Mich.

rule than that produced by other methods. In some cases, the active period appeared to continue for more than 48 hours. Cows bred on the first and third days with these prolonged periods conceived. Therefore, this did not appear to be harmful.

TABLE I. Influence of Various Treatments for Anestrum In Producing Estrum in Dairy Cattle

	Method of Treatment			
	Exam. Only	Exp. C. L.	Stilbestrol 25-50 mg.	E.C.P. 6 mg.
Number Treated	25	54	28	13
Number in estrum within 10 days	8	27	15	11
Percentage in estrum within 10 days	32	50	53.57	84.61
Total number in estrum within 30 days	20	45	24	13
Percentage in estrum within 30 days	80	83.33	85.71	100
Number in estrum after 30 days	5	9	4	0

All differences were tested for statistical significance by the chi-square technic. It was found that 84.61% of the cows treated with E.C.P. coming into estrum within ten days, when compared to other methods of treatment, was highly significant; however, differences at 30 days were not significant.

Stilbestrol produced the next highest percentage of cows in estrum within ten days. However, the difference of 53.57% for stilbestrol when compared with 50% for manual expression of the corpus luteum was not significant. Both of these groups had significantly higher percentages of cows in estrum than the control group with only 32% in ten days. The differences between all groups were not significant at 30 days.

Cows receiving stilbestrol came into heat in from one day after treatment to those showing no response after 60 days. Animals in the latter group were usually retreated by manual expression of the corpus luteum. Stilbestrol was given in doses of 25, 30, 40, and 50 mg. No great difference in efficacy could be observed by increasing the dose from 25 to 50 mg. However, of five cows receiving 50 mg., two developed cystic ovaries. One of the ten receiving a 25 mg. dose of stilbestrol also developed cystic ovaries following treatment. This condition was corrected in the three cows by further administration intravenously of anterior sheep pituitary extract, vetrophin®[a].

Cows treated by manual expression of the corpus luteum developed signs of estrum in a pattern similar to that produced by stilbestrol. However, these signs did not occur earlier than the third day after treatment. When retreatment was necessary, manual expression of the corpus luteum was again performed.

Influence on Conception

Table II shows results obtained by four methods of treatment on conception rate. Cows treated with E.C.P. had a highly significant, greater conception rate within ten days after treatment than any of the other three methods. Two of the cows in this group came into estrum within two days after treatment and conceived when bred at this time. Another conceived on the third day and remained strongly in heat throughout the fourth day. Three others were in estrum on the tenth day after treatment and conceived at this time. No conceptions took place in this group between the tenth and 30th day. However, at the end of the 30-day period animals treated with E.C.P. still led with the highest percentage of conceptions. At this time 48.14% of the group treated by manual expression of the corpus luteum had conceived. Differences between these two groups were not significant. Also, the differences between E.C.P. and stil-

TABLE II. Influence of Various Treatments for Anestrum On Conception In Dairy Cattle

	Method of Treatment			
	Exam. Only	Exp. C. L.	Stilbestrol 25-50 mg.	E.C.P. 6 mg.
Number Treated	25	54	28	12
Number conceived within 10 days	4	13	4	6
Percentage conceived within 10 days	16	24.07	14.28	50
Total Number conceived within 30 days	7	26	10	6
Percentage conceived within 30 days	28	48.14	35.70	50
Number conceived after 30 days	15	27	14	5
Number culled as sterile	3	1	4	1

®[a]Abbott Laboratories, North Chicago, Ill.

bestrol in conception rate was not significant at 30 days; however, difference between the E.C.P. treated group and the control group was striking. The only other notable statistical difference in conception rate occurred with group II, which was significantly higher than group I 30 days post-treatment.

Discussion

In the group treated with stilbestrol, three cases of cystic ovaries developed which required additional endocrine therapy. Of 54 animals treated by manual expression of the corpus luteum, there were three recorded cases which exhibited depression within a few hours after treatment. This did not last longer than 24 hours, and there appeared to be no permanent ill effects. Danger of hemorrhage following removal of the corpus luteum has been cited by some practitioners.

No additional endocrine disturbances were noted in the group treated with E.C.P. In all groups, there were some cows which were given intrauterine treatment with antibiotics before conception occurred. Animals that were culled as sterile usually had complicated difficulties and were culled after other types of sterility treatments had also failed. No animals were culled as the direct result of any of the treatments for anestrum discussed in this paper.

Summary

A comparison of treatments for anestrum in 120 cows has been made. The treatments used were manual removal of the corpus luteum, 25 to 50 mg. doses of stilbestrol, 6 mg. doses of E.C.P. and a control group which received only a rectal examination.

E.C.P. produced a statistically significant higher percentage of cows in estrum within ten days after treatment than any of the other methods. Manual expression of the corpus luteum and stilbestrol also produced a significantly higher percentage of cows in estrum in the first ten days over the control group.

E.C.P. again produced the highest percentage of conceptions within the first ten days, and had a highly significant lead over the other three groups. Manual removal of the corpus luteum had a significant advantage over the control group, but not over stilbestrol at the end of the 30-day period.

No serious complications resulted from any of the treatments, but some further endocrine disturbances were noted in the stilbestrol group, and transient illness was observed following removal of the corpus luteum.

REFERENCES

1. Bhattacharya, P., Hammond, J., and Day, F., Bovine Sterility Treatment of Cows and Heifers Which Do Not Come in Oestrus. *Vet. Rec.*, 53:450, 1941.
2. Cameron, H. S., Clinical Observations on the Use of Equine Gonadotropins in the Mare and Cow. *Jour. Am. Vet. Med. Assn.*, 100:60, 1942.
3. Folley, S. J., and Malpress, F. H., Bovine Sterility — The Use of Oestrogens for the Induction of Oestrus in Anoestrus Cattle. *Vet. Rec.*, 53:551, 1941.
4. Barret, G. R., Casida, L. E., and Lloyd, C. A., Measuring Breeding Efficiency by Pregnancy Examination and by Non-Returns. *Jour. Dairy Sci.*, 31:682, 1948.

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Effects of Nitrofuran Compounds on the Testis of the Rat

Cessation of sperm production in the testes of rats can be caused by the injection or administration by mouth of certain drugs known as nitrofurans, according to studies reported before the American Physiological Society by Dr. Warren O. Nelson and Mr. Emil Steinberger of the State University of Iowa College of Medicine.

The nitrofurans are compounds related to vegetable sugars and are prepared from corn cobs or oat hulls. They have antibacterial properties, being effective against many types of bacteria commonly found in infections of the body surface, and recently shown to be highly effective against coccidiosis in chickens. The three compounds, furacin, furadroxyl, and furadantin, were shown to be effective in that order in halting sperm formation. The doses required to produce the effect caused no other detectable change in the animals and no evidence of permanent damage to the testes. Recovery of sperm production occurred within six weeks even in ten-month-old animals which had been treated from birth on a diet containing one of the drugs.

It is believed that the nitrofuran compounds inhibit sperm formation by interfering with the activity of important cellular enzymes, specifically those enzymes concerned with the metabolism of carbohydrates. In the presence of the nitrofurans, the sperm producing cells are unable to secure the necessary energy for continued development and remain as immature cells until treatment is withdrawn. As the effect of the drug disappears the germ cells resume their usual activity and normal production of sperm is restored.

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A.V.M.A—Toronto, Canada July 20-23, 1953

Complete Veterinary Service Should Include Poultry*

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In the last few years, it has been difficult for many veterinarians to engage in poultry practice because of increasing numbers of livestock in the Midwest and proportionate increased demand for veterinary service. Some are hesitant, therefore, to enter this relatively new phase of practice.

Operators of various poultry enterprises are suffering great losses without realizing the limitations on profits due to disease losses. Sound disease control measures are not being practiced and, as a result, losses due to disease are larger than they need be.

Perhaps one of the reasons veterinarians have hesitated to devote time to developing poultry practice is that they believe monetary returns are small and that the average price of a chicken or turkey is too small to warrant a fee for professional service. This is a misconception, because poultry diseases are flock problems, frequently representing more group value than any single animal on the farm.

Another factor of hesitation on the part of some to enter poultry practice was the paucity of information on poultry as taught in our schools. The position was taken all too frequently that when chickens sickened the best suggestion was to lay out a program of sanitation and disease prevention which, if it had been followed in the first place, might have obviated need for treatment, vaccination, or other control programs. In addition, courses have been very primary, with little time or effort spent in pursuit of poultry pathology. Training formerly was not enough to interest students in doing anything with poultry.

Another factor that has held the veterinarian back in attempting poultry practice has been the type of competition. Producers of poultry remedies have numerous salesmen that can scent poultry disease from afar and need only an indication to sell everything in the book.

Operators of hatcheries have abused their positions in some instances. The hatcheryman, selling chicks, may assume responsibility for the birds for protracted periods. When something occurs in the flock, the farmer runs to the seller who has found that, in many instances, particularly when chick sales are off, the peddling of pills and fluids is lucrative.

These detriments should not stand in the way of the profession that owes to its clients an over-all veterinary service, including poultry.

Regardless of what the poultry condition is, with but few exceptions, it can be treated. Birds respond well to certain types of medication, following accurate diagnosis—apparently as well as swine and cattle.

One of the most important things the practitioner must do is to convince the farmer that he is interested in poultry. This can be done easily by inquiry into the state of health of the flock. The answer will frequently indicate difficulties and extensive losses. It is most important to back this interest with knowledge.

Summary

The field of poultry disease control is most confused on disease recommendations due to a general lack of accurate diagnosis of poultry problems. In general, diagnosis and resultant treatments are based on guess rather than actual facts. The practicing veterinarian can be of great service to the poultry industry and to his clients. He should avail himself of adequate laboratory facilities and render an accurate diagnosis of poultry problems.

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Vaginitis typically is responsible for much breeding difficulty in the minds of herdsmen. Actually, in our experience, it seems not to interfere to any great extent. The disease is in reality more deeply situated. Granular vaginitis is observed as small pin-point lesions inside the lips of the vulva. The condition is acute in some herds and spreads rapidly.

Treatment does not appear to alter the course of the disease, which is extended for approximately three to four weeks, followed by spontaneous recovery. It never recurs in some herds.—*A. A. Woelffer, D.V.M., Oconomowoc, Wis.*

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One bite of a mussel can be fatal during the summer, due to the toxins of a dinoflagellate, *Gonyaulax catenella.* Mussels ingest these organisms and store the toxins; clams are subject to the poisoning in lesser degree, and the white meat is considered safe if thoroughly cleaned and washed. The organism, found in California waters, is the cause of red ocean water and phosphorescent areas. It is reported to have caused the death of President Harding.

There is no danger of the poisoning from commercial outlets. The Food and Drug Administration has an official assay method to detect the toxin.

*Presented at the 69th annual convention of the Indiana Veterinary Medical Association, Indianapolis, January 14-16, 1953.

**Extension veterinarian, Iowa State College, Ames.

Some Common Sheep Diseases in Kentucky*

ROSS BROWN,** D.V.M., Lexington, Kentucky

AT the University of Kentucky, 236 sheep were autopsied last year (1952). It might be of interest to know what diseases were found most often and at what time of year these occurred.

Internal parasites head the list of diseases responsible for death, with 71 cases. Of these, 50 were due to stomach worm infection and 21 to tapeworms. Pneumonia was second, with 42 cases. Enterotoxemia (overeating disease or pulpy kidney disease) was third, with 26 cases, and tetanus was fourth, with 20 cases. In addition, a great many other diseases were observed.

From the number of autopsies performed each year, I have come to the conclusion that most cases presented to the laboratory are either directly or indirectly due to poor management, poor feeding, and parasites. I have also observed that treatment is of little value unless these factors are remedied. Also, one of the important phases of good treatment is nursing. Quite often farmers expect a veterinarian to give a "shot" or a pill and the animal to recover without any help from the owner. The shepherd should provide proper housing conditions, water, and appetizing feed. Animals down should be turned from time to time and force-fed if necessary.

Internal Parasites

Some persons believe that internal parasites, such as the stomach worm of sheep, may be controlled easily. This unfortunately is not true. In practically every case presented to the laboratory for diagnosis, internal parasites complicate the disease picture. In the South, there is no stomach-worm season, and cases may be observed during all seasons. The complaint is often heard from farmers that phenothiazine and salt do not control stomach worms. This is because the recommended worming program has not been followed. All sheep should be treated with a therapeutic dose of phenothiazine at least twice yearly. They then should be put on phenothiazine and salt mixture (1 lb. phenothiazine to 9 lb. salt) continuously, even during pregnancy. If they are not dosed first, salt mixture is of little value. If the supply of the salt mixture runs out for a week or so, sheep should be dosed again before being placed on the routine mixture. Unless the farm is heavily infested, this program will keep the worm count down so that little damage will be done. Each time the flock is dosed, they should be put on clean pasture. If, after dosing, sheep are turned onto contaminated ground, they will become reinfected the next day.

Tapeworms present quite a problem in some areas of Kentucky. We have been recommending phenothiazine plus lead arsenate as a drench and, in most cases, these drugs have done the job. On our own flock, we use the old bluestone and blackleaf 40 treatment once a year to treat for the worms phenothiazine and lead arsenate may have missed. Most tapeworm cases occur during May, June, or July, or when lambs weigh approximately 40 lbs. Quite often lambs are observed to be infected with both stomach worms and tapeworms. Typical history of tapeworm infection is when a farmer finds one of his best and fattest lambs dead — a lamb which was eating and presumably normal the day previously. If any symptom besides death is observed, it is diarrhea. Quite often the lamb is dirty in the rear a day or so before it dies.

The preferred method of dosing sheep is by use of a 3-in. nozzle on a 2-oz. dose syringe, using a suspension of phenothiazine. The drug should be purchased already mixed as it will stay in suspension longer than powder that is home mixed. Every year sheep are received for diagnosis where a dose syringe with a long nozzle has been used. This long nozzle causes injury to the soft parts of the throat and causes an abscess under the jaw. I have seen cases where farmers have lost quite a few ewes with these abscesses.

Pneumonia

Pneumonia occurs most frequently in lambs from January to April. It is difficult to diagnose unless one is observant. These cases develop so rapidly that, by the time they are diagnosed, there is little chance for favorable outcome. This disease moves so quickly that

*Presented at the 69th annual convention of the Indiana Veterinary Medical Association, Indianapolis, January 14-16, 1953.

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I call it "galloping pneumonia." Most of these cases are caused by poor housing conditions, little help at lambing, and starvation. Quite often farmers say they saw the lamb nurse, but when the stomach is opened, only wool is found, these lambs having sucked wool instead of a teat. We have been able to save some of these weak lambs by administering 5 cc. dextrose immediately after birth. This is given just under the skin in back of the front leg every three to four hours until the lamb is strong enough to nurse.

Enterotoxemia

Pulpy kidney disease (overeating disease or enterotoxemia) is on the increase in Kentucky. The name "overeating disease" is not an appropriate designation since the disease has been observed in lambs on pasture and that have not been receiving grain. On autopsy, kidneys appear pulpy, and quite often tapeworm infection is noted. Most cases are observed from February to June, developing soon after the lamb starts eating with ewes. On culture of kidneys, a Clostridium organism is recovered; we have recovered six different organisms of this genus. Here again, the most common history is that a farmer found one of his largest, fattest lambs dead. Any time one finds a large, fat lamb dead, either tapeworms or pulpy kidney disease can justly be suspected. There is generally little opportunity for treatment as the disease cannot be diagnosed sufficiently early. The disease is easy to prevent by proper vaccination; lambs are given 5 cc. of antitoxin when they are three to six weeks of age and, at eight weeks, 5 cc. of bacterin are injected. We have never lost a lamb from this disease where this program was followed.

Tetanus

Most tetanus cases are presented during the period from January to March. This is the time of year lambs are docked and castrated and also when weather conditions are inclement and sheep are kept in the barn. Every case observed last year, except one, was from the use of the elastrator (rubber band) for docking. With this type of docking, ideal conditions are set up for the growth of the tetanus organism. The farmer will notice the infected lamb beginning to manifest stiffness in about ten days to two weeks after the elastrator is used. Death follows in a short time. If these lambs are given tetanus antitoxin as soon as they become stiff, some may be saved.

Ketosis

In spite of all the new treatments (use of cortisone, for example), the best way to prevent pregnancy disease (lambing paralysis or ketosis) is through proper feeding. A ewe should gain 25 to 30 lb. from breeding to lambing. Quite often a farmer will see the fat on a ewe which has died of pregnancy and say, "Doc, she couldn't have had pregnancy disease, look how fat she was." What he did not realize was that the ewe may have been losing instead of gaining weight each advancing day of pregnancy.

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Cattle Losses Due to Food Pellets

Recent heavy cattle losses in several states have been caused by livestock feed processed into pellets. In one of these, machines used in manufacture were discovered to be lubricated with a grease containing 10% of a highly chlorinated naphthalene.

Caution notices have been mailed by the USDA emphasizing the dangers and calling attention to the fact that serious cattle losses may result due to lubricants used in the preparation of pellets if these contain the product known to be toxic.

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In considering the public health importance of histoplasmosis, it is necessary to recognize that an infected dog can disseminate the disease by way of the feces, vomitus, sputum, and urine. Experimental evidence has shown that dogs can be artificially inoculated by the tracheal route; these animals sicken and die. Presumptive evidence is at hand that shows that susceptible dogs can be infected through contact with infected carriers. Evidence has also shown that workers contacting infected pigeon excreta have contracted histoplasmosis.

In view of the foregoing evidence, sanitary recommendations at the present time would include handling infected animals with knowledge that the disease is common to man, ridding the premises of excreta from infected animals and parasites that may be vectors of the disease, and disinfecting quarters, utensils, and runs with 2% copper sulfate solution.—*C. R. Cole, D.V.M., Columbus, Ohio.*

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Nutritionally deficient mature cats evidence absence of libido. This state is similar to that of an immature cat. Both groups are highly susceptible to fungus infections.

Hexylcaine Hydrochloride In Veterinary Surgery

J. L. McAULIFF, D.V.M., W. V. PHILLIPS, D.V.M., and J. R. STEELE, D.V.M., Cortland, New York

THE use of anesthesia in veterinary surgery is an obvious one. It is not enough that comfort of the patient and successful conclusion of surgical technic be considered. Ability to make proper application of anesthetic agents as a means of restraint not only will increase the operator's efficiency and make it easier to handle the patient, but it should be accepted as a routine part of his armamentarium as a professional man. We agree with the statement of Bemis[1]: "The proper use of local anesthesia by the infiltration method, or of regional anesthesia by nerve blocking has come into wide use in all species, has not only rendered even the extensive surgical operations painless, but has simplified the control of patients, enabled the operator to put his whole attention upon the operation, and has cut down the danger that has come from general anesthesia."

Since introduction of the epidural block in cattle by Benesch, in 1926, this method of administering anesthesia has been accepted by veterinary surgeons. Unfortunately, some difficulties encountered usually are the result of improper administration or of undesirable characteristics of the agent employed. In our practice, we have, from time to time, endeavored to find a better agent in order to eliminate some of these difficulties.

When choosing any local anesthetic agent for routine clinical use, a combination of several desirable properties is necessary. On the basis of efficacy, the accepted agent should be absorbed rapidly and produce quick-acting response by giving complete anesthesia within three to five minutes, yet have a duration of effect that will last longer than the contemplated surgical procedure. A safety factor of low toxicity is important for a number of reasons: First, low level of toxicity is necessary to prevent possible nerve structure damage or tissue necrosis whenever any agent of long duration is injected; second, and equally important, it is necessary to consider possible permanent damage to tissues and bones of the pelvic region when unintentional overdose or animal sensitivity causes the animal to become unsteady in the hind limbs through loss of motor nerve control. A safety factor is that the lower the concentration in which the local anesthetic agent is effective, as opposed to the concentration causing acute toxicity, the greater the margin of safety. In addition to the above requisites, it is believed that the ideal agent is one that can serve a dual purpose: utility for skin or tissue infiltration, and utility for surface anesthesia when applied topically to mucous membranes.

Beyer, *et al.*,[2] in an attempt to determine desirable attributes of the compound, cyclaine,®[1] compared the agent with six other well established local anesthetic agents. They concluded that it is a safe agent and found that it has a low order of toxicity, as compared to some other local anesthetic agents. They also concluded that the agent would prove to be useful in the clinic.

The first published report on clinical use of cyclaine was by Ruben, *et al.*[3] when this agent was used for spinal anesthesia in human patients. At the time of their published report, it had been used successfully in over 100 patients. It was the authors' experience that the dose of cyclaine was in most instances not only one-third that of procaine, but also that the agent was more effective in weaker concentrations, indicating that the drug provides more complete and longer lasting nerve block in smaller doses relative to its animal toxicity, than does procaine. In no instance, was there any local or general toxic reaction or irreversible change in nerve function when average duration of effect in this clinical trial was from 60 to 90 minutes. They found the agent stable under conditions of boiling and autoclaving.

Metycaine,®[2] nupercaine,®[3] and cyclaine were compared by Torkelson, *et al.*[4] in human patients as anesthetic agents in single injection technic, where no preliminary skin or deeper tissue infiltration was used, in over 4,000 obstetrical cases delivered by low spinal anesthesia. It was their opinion that cyclaine proved to be the best of the drugs used in this series. The agent gave uniformly good block and only rarely was a poor or "spotty" block obtained. Average duration of effect was one hour and 40 minutes. Only in occasional in-

®[1]Sharp & Dohme, Inc., Philadelphia, Pa.
®[2]Eli Lilly and Company, Indianapolis, Ind.
®[3]Ciba Pharmaceutical Products, Inc., Summit, N. J.

stances was it necessary to administer ephedrine to combat fall in blood pressure.

Extensive comparative investigation with some local anesthetic agents in cattle was undertaken by Roberts[5]. He concluded that cyclaine showed more prolonged anesthetic effect when used epidurally than did procaine, procaine and epinephrine, pontocaine,®[4] or cobefrin®[5]. He suggested that it would be more effective in management of prolapse of uterus and vagina, long difficult dystocia, operations on perineum, and tenesmus due to severe vulvitis or vaginitis, than would other drugs or combinations.

Of particular interest was the fact that Roberts found this agent to have other useful characteristics. He used it as a local anesthetic in 1 to 2% solution on the eye. In eight cows and two horses, where it was used as a corneal anesthetic, satisfactory anesthesia was obtained in one to four minutes and persisted for approximately one hour. No immediate or subsequent irritation of the eye was observed from the drug in this concentration. Paravertebral nerve block also was obtained with cyclaine when the solution was placed over each nerve. Good anesthesia of the flank was maintained for three hours.

Clinical use of cyclaine as epidural anesthetic, as an agent for paravertebral nerve block in large animals, for skin infiltration, and topical anesthesia was reported by Wheat[6]. It is his opinion that this agent "Approaches more closely the requirements of the ideal anesthetic than does procaine, as it is effective whether injected or applied topically."

Strickland's[7] preliminary observations on use of cyclaine topical ointment in human patients who show sensitivity to other 'caine' ointments applied topically indicated no cross sensitivity.

Epidural Anesthesia

In preliminary clinical investigation, cyclaine was used in various concentrations as shown in table I. They include representative cases of the type in which we used the agent, concentration and dosage used, as well as results obtained. The drug has been used as a local anesthetic in more than 200 cases. In cows, epidural block was obtained by administration through the space between the arches of the first and second coccygeal vertebrae. Concentrations used in all cases were sufficient to paralyze completely sensory fibers and skin, without affecting motor control of hind limbs.

It has been noted that the dose to be administered is dependent upon weight of the animal and will vary from 5 cc. to 10 cc. of a 5% solution. Usual dose recommended is 5 cc. for a 700 lb. animal and 10 cc. for one weighing 1,500 lb., and graduated dosage for those within the 700 to 1,500 lb. weight range.

It should be noted that a dose of 10 cc. of the 5% solution injected into the epidural space gives good results but does not cause the animal to lose use of its hind legs. Patients so treated are able to stand and move about without difficulty after such a dose has been administered. In parturition cases, straining ceases, but uterine contractions are not influenced.

®[4]Winthrop-Stearns, Inc., New York, N. Y.
®[5]Cobefrin is a preparation of Cook Waite Lab. Inc., composed of 2% novocain (procaine), 0.0015% pontocaine, and corbasil 1:10,000. The action of the latter is similar to epinephrine.

TABLE 1. Summary of Results

Case No.	Specie	Operation	Route inject.	% Sol.	Amt. Inj. cc.	Evaluation
1	Bovine	Opening abscess	Infiltration	1	10	Fair
2	Bovine	Modified Caslick	Epidural	5	5	Excellent
3	Bovine	Modified Caslick	Infiltration	5	5	Excellent
4	Bovine	Straining violently	Epidural	5	5	Good for 6 hr.
		(second treatment)	Epidural	5	10	Excellent for 12 hr.
5	Bovine	Two teats occluded	Infiltration	5	5	Good
6	Bovine	Prolapse uterus	Epidural	5	5	Excellent
7	Bovine	Straining after calving	Epidural	5	5	Excellent, held better than 6 hr.
8	Bovine	Prolapse after replacement	Epidural	5	5	Excellent
9	Bovine	Teats cut on barbed wire	Infiltration	1	5	Excellent
10	Bovine	Prolapsed vagina	Epidural	5	10	Excellent, lasted better than 12 hr.
11	Bovine	Prolapse uterus	Epidural	1	10	Good
12	Canine	Cesarean	Infiltration	1	10	Excellent
13	Canine	Removing cyst	Infiltration	1	15	Excellent

Epidurally the 5% solution is used for difficult dystocias, in doing the Caslick operation, for relief of straining that may occur after freshening, in removal of retained placenta, and in prolapsed uteri.

Skin Infiltration

As a local infiltration agent, cyclaine was injected around surgical areas in the cow, dog, and horse, to control pain when counterirritation is applied, and in cesarean section of the cow or dog. In various concentrations used, it was shown that the agent exerts prompt and complete anesthesia of the area. Injections were made into subcutaneous tissue of the area and did not cause pain or irritation at time of injection.

Testing of the anesthetized area by pinching or pricking the skin with a pointed object, for various periods after surgery, indicated that local infiltration was quite satisfactory. Average duration of effect was six hours.

Summary

1. Cyclaine was noted to be a satisfactory anesthetic agent. It has been employed locally for infiltration purposes around surgical areas in the cow and dog, cesarian section in cow and dog, and to control pain when counterirritation is applied in the horse. The agent was used to produce epidural anesthesia in cattle for difficult dystocia, straining after freshening, prolapsed uteri, and to assist in removal of placenta where animals strain severely and in performing the Caslick operation.

2. Amounts of from 5 to 10 cc. of a 5% solution, when used for epidural anesthesia in cattle, produced satisfactory anesthesia without causing the animal to lose motor control of its extremities or to become unsteady in hind quarters.

3. The agent has proved to be highly desirable since it has properties of initiating quick response and maintaining long duration of effect. There was no observable indication of toxic manifestation in either tissues or nerves anesthetized for long periods of time.

4. The advantages of cyclaine as an epidural agent, over other preparations used, is that it is longer-lasting (six- to 12-hour duration); it gives good anesthesia but does not paralyze, so that the animal can stand during anesthesia; side effects, such as systemic reactions or complete paralysis of the tail, are *nil;* it is an aqueous product, easy to use and handle; the product has been found to be quite stable.

REFERENCES

1. Bemis, H. E., Veterinary Surgical Operations, Worman Printery Incorporated, Teutopolis, Ill., 1948, p. 25.

2. Beyer, K. H., Latven, A. R., Freyburger, W. A., and Parker, M. P., A Comparative Study of the Activity and Toxicity of Hexylcaine (1-cyclohexylamino-2-propylbenzoate); a New Local Anesthetic Agent. *Jour. Pharmacol. and Exptl. Therap.*, 93:388, 1948.

3. Ruben, J. E., and Anderson, E., Hexylcaine Hydrochloride, A Preliminary Report of its Clinical Use in Comparison With Procaine. *Am. Jour. Surg.*, 78:843, 1949.

4. Torkelson, H. P., and Cooley, C. L., Single Dose Low Spinal Anesthesia in Obstetrics. *Western Jour. Surg., Obst., Gyne.*, 59:533, 1951.

5. Roberts, S. J., A Comparison of Anesthetics Used in the Bovine Animal. *Jour. Am. Vet. Med. Assn.*, 116:282, 1951.

6. Wheat, J. D., The Clinical Use of Cyclaine® Hexylcaine Hydrochloride as a Local Anesthetic. *Jour. Am. Vet. Med. Assn.*, 120:71, 1952.

7. Strickland, S. C. Personal communication.

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The maximum time one can depend on passive immunity derived from the injection of hyperimmune serum has not been determined. It is generally believed that animals may be protected against evident infection or even massive natural infection for ten days. Many factors influence the time interval, but the amount of serum injected has no influence on the duration of such conferred immunity.—*James A. Baker, D.V.M.*

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Hog cholera has spread into six counties in Ontario, Canada, according to report of the Canada Agricultural Ministry. All infected animals are being destroyed and premises held under strict quarantine. Hogs on adjoining premises are being protected with injections of hyperimmune serum. Source of infection has not been established.

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The feeding of fish-oil supplements to poultry may result in positive reactions to the agglutination test for pullorum. These false reactions develop within a few weeks after the commencement of feeding the oil and disappear equally rapidly when the oil is removed from the ration. It is recommended that the oil not be fed for four weeks prior to the testing.—*Austral. Vet. Jour.*, 28:201, 1952.

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Losses of baby pigs occur in largest numbers between the first and third week. The three most important causes of death are: hypoglycemia, transmissible gastroenteritis, and the uremia-toxemia complex.—*H. C. H. Kernkamp, D.V.M., St. Paul, Minn.*

Practice Builders: Interest in Clients and Their Pets*

DEETS PICKETT, D.V.M., M.S., Kansas City, Mo.

A practitioner should be interested in his clients — they are among the finest people in the world — they are the people who provide his bread and butter. Sincere interest is best manifested by being truly sympathetic with client problems. Regardless of the kind of animal or how worthless it may be in the examiner's eyes, it should be remembered that, if the client loves the animal, it is his privilege to have the respectful sympathy of the doctor, as though the animal were worth a thousand dollars.

A year or so ago, a man of agitated mien walked into an animal hospital with a small box under his arm. Upon seeing the doctor, his first remark was, "Are you a veterinarian?" Since it was obvious that he was talking to a veterinarian, it seemed that there was some point he wanted to prove. When the doctor answered, "Well, I try to be," he said, "Good, then you agree that a veterinarian is supposed to help sick animals?" The answer being in the affirmative, he added, "Well, I have a sick animal here that I have had to three other veterinarians. They just laughed at me and told me to kill it. Will you help me?" With that he opened the top of the cardboard box and allowed the doctor to look in. The container held the patient, an emaciated white rat. The doctor assured the owner that if it were possible, he would help the little fellow. On examination, an intestinal fistula was revealed. It had been draining for two or three months. Although it appeared ridiculous for an owner to be so attached to a rat, the practitioner did not show his feelings. If the client loved that white rat, the doctor wanted to help him.

It was explained that, because of the depleted condition of the animal, chances were much against its survival. The client was charged $35. for surgery and $5. a day for after care. The work was well worth the charges; a portion of the intestine was removed and the two ends anastomosed. Just as much of an effort was made to save that rat as if it were the most expensive animal in the hospital. The rat died, but the owner realized that the doctor had done his best. He has since become one of the hospital's best clients, having purchased a dog and referred numerous other clients.

Another way to show sincere interest is, after leaving the sick animal with an assistant, to obtain and record a complete medical history. It is recommended for several reasons. First, it affords the client opportunity to talk about his pet. He enjoys doing so. The conversation is directed with questions. Second, he is impressed with the interest shown, and compares it favorably with that of his own physician who attaches considerable importance to medical history. Third, it further impresses him with thoroughness. Fourth, many times it gives a clue not previously indicated. Fifth, it affords a valuable, permanent record that can serve as a reference in years to come. Sixth, because the client will want to take his pet to a place where the complete medical history is known, it may well be a deciding factor in preventing him from taking his dog elsewhere for treatment. Seventh, it pleases the owner in years to come if one is able to say, "Well, four years ago this animal had a similar condition. Do you remember how it began?"

Another point which may be mentioned here is that one can cultivate a loyal client, not only by giving good care to his animal, but by being interested enough to remember the things he says. For instance, he may make a passing remark concerning a certain political situation, or he might mention that he has three boys and a girl, or that his son was confined in the hospital. The practitioner cannot remember what every client says, of course, but he can record it. The client will be pleased if, after the passage of time, the practitioner remembers what was said, or inquires concerning his three boys and his daughter, or asks about the little boy that was in the hospital. The written record does not detract from the sincerity of the inquiry if one is actually interested. Unless interested, it is better to say nothing, because insincerity shows through. Plain "lip service" fails.

It is well to remember also that conversation should be along the client's interest. When he first comes into the hospital, the average owner is not at all interested in whether or not one can pay the light bill, but if proper interest is shown in his problems, the client will help pay it.

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American Kennel Club application for registration of litters whelped by bitches artificially inseminated would include: (1) A properly compiled litter application form; (2) an owner's affidavit that he was present when a licensed veterinarian extracted the semen from a male; (3) a veterinarian's affidavit that semen was extracted in the owner's presence; (4) affidavits from the owner and the veterinarian that the bitch was inseminated in the presence of each.

*Excerpt from a chapter of Doctor Pickett's forthcoming book The Art of Developing a Practice.

Open Reduction For Correction Of Coxofemoral Dislocations

JAMES ARCHIBALD,* N. M. BROWN,* E. NASTI,*
and WM. MEDWAY,* Guelph, Ontario, Canada

IN 1938, Bottarelli[1] published a paper on the technic of reducing anterodorsal and posterodorsal luxations of the coxofemoral joint, using the open reduction method. However, review of the literature reveals that little has been written on this subject and this paper is presented with the belief that the method used in cases discussed is more simple and direct than any previously described.

Many coxofemoral dislocations seen at this clinic have been long standing, some present for more than three months. The most common type is anterodorsal luxation, in which the head of the femur is thrust out of the acetabulum to rest upward and forward on the ilium at the acetabular rim. It is believed that many of these cases involve rupture of the teres ligament and tearing of the joint capsule in course of dislocation. Cases which are long standing are presented to the clinic because the animal has remained lame and the commonly anticipated pseudoarthrosis has not materialized. It is for these cases that the authors believe open reduction is indicated. However, we do not hesitate to perform open reduction even in recent dislocations which resist manipulative efforts to achieve closed reduction.

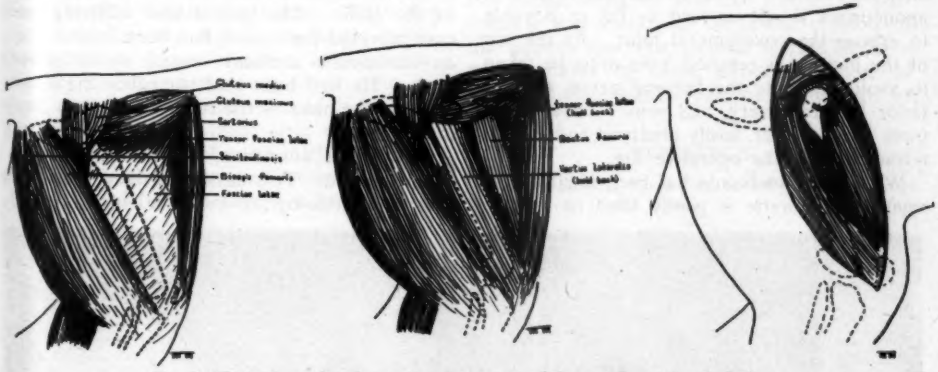

Fig. 1. Illustrating related structures in surgery of the coxofemoral articulation.

When rupture of the teres ligament and joint capsule occurs, more or less severe hemorrhage takes places into the acetabulum. After this clots, it is difficult to achieve satisfactory reduction because there is insufficient space in the acetabulum to permit complete

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return of the femoral head. Later, the blood clot is replaced by fibrous tissue and reduction becomes impossible. As the head of the femur pushes upward it breaks muscle fibers attached to the ilium. Here again, hemorrhage is a feature and fibrous tissue quickly forms around the head of the femur and muscles which have been torn.

Although fibrous tissue is greatly in evidence at point of dislocation, it should be emphasized that this does not result necessarily in formation of a false joint. Attempts to reduce such dislocations by manipulation alone are extremely dangerous and are likely to result in fracture of the head of the femur.

Technic

Skin incision is made as for open reduction of femoral fracture; that is, from the trochanter major to the region of the stifle joint, using the anterior border of the femur as a guide line. The fascia latae is then cut from the middle of the femoral shaft upward over the trochanter major. This maneuver will expose the vastus lateralis (fig. 1).

There is a clearly evident line of aponeurosis where the anterior border of the vastus lateralis attaches to the rectus femoris. This aponeurosis is slit upward as far as possible to expose the coxofemoral joint. As the top of the incision is reached, care must be taken to avoid injury to the femoral nerve, the anterior femoral artery, and vein. These structures are, however, easily observed and can be retracted from the operative site.

When the acetabulum has been identified, a small bone curette is gently used to remove fibrous tissue. This must be thoroughly removed as the successful end result of the operation depends upon ability of the acetabulum to retain the head of the femur.

Clearing fibrous tissue from the femoral head is a tedious job that must be performed carefully and thoroughly. Blunt dissection with a pair of closed forceps will break down this tissue. As much is removed as possible, and the head gently curetted until smooth and free of tissue.

When the femur is free, reduction is usually accomplished easily, by flexing the leg, rotating the stifle inward, and pushing the trochanter major down toward the acetabulum at the same time as extension is applied to the leg.

In all the cases so far encountered, the joint capsule has been badly torn and it has been impossible to locate enough capsule in which to insert sutures. No attempt, therefore, is made to close the joint. Fascial planes are secured with a few interrupted sutures and skin closed with interrupted vertical mattress sutures.

Case Histories

Case 1. On September 11, 1951, a 15-month-old male Boston Terrier was admitted to the clinic. The practitioner referring the case reported the animal had been involved in an automobile accident several weeks previously. He had been able to reduce the luxation but the head of the femur refused to stay in position.

On day of admission, the dislocation was again reduced. Two days later there was clinical and radiological evidence of luxation.

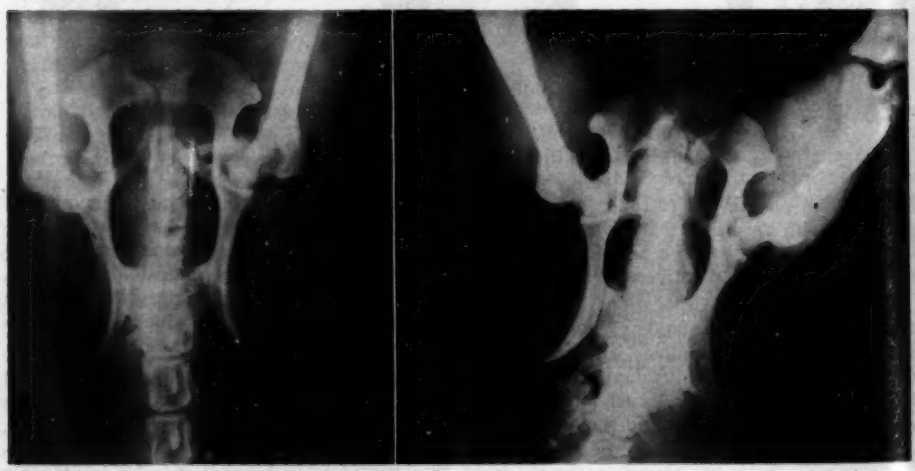

Fig. 2. Coxofemoral disarticulation of several weeks duration that recurred after reduction by manipulation. At right, view postoperative following curettage of the acetabulum.

After consultation with the referring veterinarian, it was decided to resort to open reduction. This was accomplished uneventfully in the manner described. Since this was one of our earliest cases, supplementary fixation in the form of a plaster cast was applied. Ten days later the cast was removed. The animal was discharged to the owner four days following removal of cast. Recovery was uneventful. (Fig. 2).

Case 2. On September 6, 1952, a three-year-old male Collie exhibiting a marked limp, was admitted to the clinic. The practitioner referring the case had tentatively diagnosed the condition as a coxofemoral luxation but had been unable to confirm this because he lacked *x*-ray facilities. History available was that the animal had been struck by a rubber-tired wagon three weeks previously. Clinical diagnosis of coxofemoral dislocation of the right femur was confirmed radiologically (fig. 3).

Attempts to reduce this luxation by manipulation alone failed. On the 12th day of hospitalization it was decided to reduce the dislocation by open reduction. Operation was uneventful and performed by the described technic. When discharged 20 days later, the animal walked with a slight limp. The *x*-ray plate taken on the day of discharge clearly shows fibrous tissue formation of a pseudo-arthrosis anterior to the acetabulum. No external method of fixation was used to keep the head of the femur in place after reduction.

Case 3. On December 15, 1952, an eight-month-old Siamese cat was presented at the clinic. The left hind leg had been injured about one week previously. Routine palpation was carried out to localize the affected area and the animal was then radiographed. *X*-ray revealed a coxofemoral dislocation with the head of the femur anterior to and slightly above the acetabulum.

On December 16, 1952, the cat was anesthetized using 1.25 cc. pentobarbital sodium intravenously, and an unsuccessful attempt was made to reduce the dislocation by manipulation. Due to duration of the condition and the possibility of the acetabulum being filled with fibrous tissue, it was decided to resort to open reduction. The leg was bound in a flexed position using a figure-eight type of bandage. *X*-ray of the leg at this time, showed that the dislocation had been reduced.

Five days after the operation the bandage was removed and the animal sent home exhibiting only slight limp.

Summary

Within recent months a series of reductions of coxofemoral dislocations by an open reduction method has been carried out in the Small Animal Clinic, Ontario Veterinary College. Three representative cases are presented in this paper, together with the technic of performing the operation. It is the opinion of the authors that this method is feasible in a great number of cases, either recent or of long standing, which resist other methods of reduction.

REFERENCE

1. Bottarelli, A., *Clin. Vet.*, 61:407, 1938 (Abst. in *N. Am. Vet.*, 21:428, 1940).

Fig. 3. Attempts to reduce luxation of the right femur by manipulation alone failed. Open reduction resulted in uneventful recovery.

Metropolitan Rabies Epizootic Controlled By Vaccination

LUTHER E. FREDRICKSON,* D.V.M., JOSEPH C. WILLETT,** D.V.M., J. EARL SMITH,† M.D., and E. R. PRICE,†† D.V.M.

RABIES has been enzootic in St. Louis for many years, though complete statistics on incidence of the disease are available only for a little more than 30 years. Since 1921 the St. Louis Health Division Laboratory has maintained accurate records of all laboratory-confirmed animal rabies (fig. 1 and 2). During this period the rabies problem has increased in magnitude and complexity; six rabies epizootics have been recorded during this time, each outbreak being more serious and of longer duration than the previous ones. (In this paper all statistics on rabies in St. Louis refer to cases which have been confirmed by the St. Louis Health Division Laboratory.)

A particularly serious rabies epizootic occurred during World War II, a total of 731 cases being reported during the three years of 1942 through 1944. This outbreak followed the pattern of previous epizootics in this city—it extended over a period of several years, the number of cases finally diminishing as the disease ran its normal course. In this outbreak, there was a period of 28 consecutive months which saw from ten to 48 cases of canine rabies being reported each month. This epizootic was followed by the most rabies-free period on record; only 24 cases of rabies were recorded from January 1945 through October 1950—the years 1947 and 1949 were entirely rabies-free.

Rabies Epizootic of 1951

Beginning with three cases of rabies in November 1950 and six cases the following month, St. Louis entered into its latest and greatest rabies epizootic. On December 15, 1950, quarantine regulations were applied, as had always been done in previous outbreaks of the disease. Yet in spite of the early application of quarantine, the number of reported

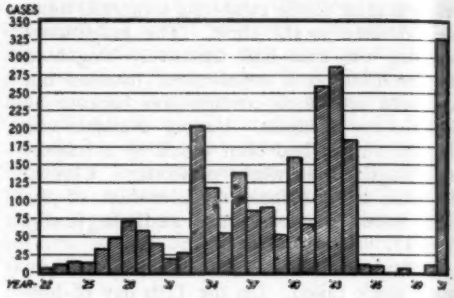

Fig. 1. Laboratory-confirmed cases of canine rabies 1921-1951 in St. Louis, Mo.

cases continued to increase. After the beginning of 1951 the climb was rapid, from 11 cases in January to 74 in April. In the first four months alone, 184 cases were recorded. This was followed by 79 cases in May. By this time, rabid dogs were reported from 25 of the city's 26 health districts, with the heaviest concentrations in the poorer central areas[1]. This rapid rise may suggest a virus of greater infectivity, "fecundity", or "transmissability"[2] than had been experienced in the previous epizootics; or a more susceptible canine population may have resulted from the low incidence in years immediately preceding the outbreak. Based on past experience with this disease, the number of rabies reports could be expected to climb higher each month, or at least to remain at a high monthly level for many months to come.

This epizootic, however, was not permitted to run its normal course; an intensive emergency control program was put into effect by the St. Louis Health Division. Measures to meet the emergency centered about: (1) securing the consultation services of the public health veterinarian of the Missouri Division of Health and other authorities in the field; (2) organizing the community's resources to carry out an effective program; and, (3) explaining to the public, through radio and newspapers, the nature of the problem and the need for action.

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†Health Commissioner, St. Louis Health Division, St. Louis, Mo. ††Public Health Veterinarian, Missouri Division of Health, Jefferson City.

Organization of the Emergency Program

On May 16, the public health veterinarian of the Missouri Division of Health recommended immediate establishment of mass dog immunization clinics, and on May 17 an emergency fund was made available for the antirabies program. A plan to carry out the program was immediately formulated. It was decided to operate 18 immunization clinics simultaneously for seven successive days (a total of 126 clinic sessions in one week). Clinics were located in health centers, police stations, community centers, parks, and other strategic spots throughout the city. The St. Louis Health Division arranged for clinic buildings, furnishings, necessary lay personnel, supplies, and publicity. A sanitarian was placed in charge at each clinic to assure smooth operation. A health division veterinarian acted as general supervisor.

Meanwhile, a number of meetings were held with local veterinarians to explain the scope of the problem and to ask for their assistance in meeting the emergency. The veterinarians readily agreed to serve in the immunization clinics. The Greater St. Louis Veterinary Medical Association assigned the veterinarians to specific clinics. Each veterinarian supplied his own instruments, and those who desired the assistance of dog handlers made their own

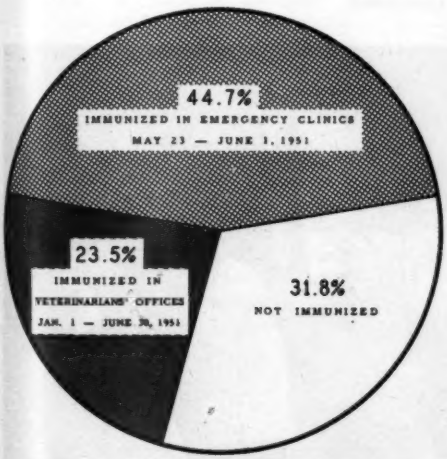

Fig. 2. Immunization status of the dog population in St. Louis during the 1951 rabies epizootic. Estimated dog numbers — 85,000.

arrangements for them. In many cases, where there were no dog handlers available in the clinics, dog owners held their own dogs for the veterinarian.

During the organizational stages of the program the Health Division issued a steady stream of news material to press and radio, and prepared publicity matter for use during the campaign. A total of 150,000 printed handbills showing the location of each of the clinics and encouraging dog owners to have their pets vaccinated, were distributed to children in public and parochial schools.

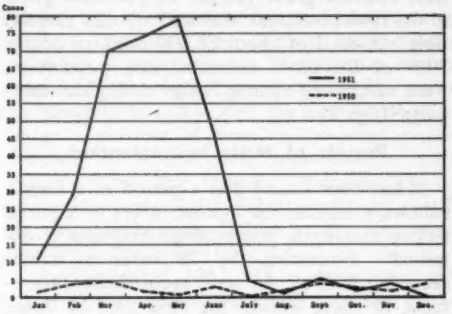

Fig. 3. Laboratory-confirmed canine rabies during 1951 and 1952, St. Louis, Mo.

The vaccine used in this program was obtained from four commercial biological houses. Phenolized vaccine was used almost exclusively. It was 20% brain and spinal cord suspensions of caprine and ovine origin. The dose of vaccine averaged 5.22 cc. per dog inoculated with phenolized vaccine. About 0.5% of the dogs were vaccinated with modified live virus vaccine. No cases of post-vaccinal paralysis were reported to the Health Division.

The 18 clinics were operated simultaneously from 4 to 8 p.m. for seven days from May 23, through June 1, being closed on Saturday, Sunday, and Memorial Day. In all, a total of 38,006 dogs were vaccinated in the clinics. A fee of $1. per inoculation was collected from those willing and able to pay. Eighty-eight percent of all vaccinations were paid on this voluntary basis. The proportion of paid vaccination varied in different locations, ranging from 43% to 99%. The two clinics which reported the lowest percentages of paid vaccinations (43% and 63%) were located in under-privileged areas.

The performance of the veterinarians during the program exceeded the expectations of even the practitioners themselves. One veterinarian with an assistant vaccinated 120 dogs in a 45-minute rush period. In eight of the clinic sessions, one veterinarian vaccinated 500 or more dogs—an average of 125 or more per hour. This experience shows that with proper

organization and with adequate help and facilities, the mass immunization of large dog populations can be accomplished during a short concentrated drive.

Not all dogs vaccinated during the epizootic were inoculated in the emergency clinics. Some 20,000 dogs were vaccinated in offices of veterinarians during the first half of 1951. This is an exceptionally large number for this city, and the great volume of publicity given to the rabies outbreak was undoubtedly responsible. A total of about 58,000 dogs, or nearly 70% of the city's estimated dog population, were vaccinated against rabies during the campaign (fig. 2).

Results of Mass Immunization

It has been found that a period of a month following inoculation against rabies is required before maximum immunologic response is obtained[8]. Following the 79 cases of rabies recorded in May, 46 were recorded in June—most of them during the first part of June, with a marked drop toward the end of that month. In July, only five cases were recorded (fig. 3). Altogether, the last half of 1951 showed a 94% reduction in the number of rabid dogs as compared with the first half of the year. During this same period there was also a 67% reduction in the number of completed Pasteur treatments given at the Pasteur Clinic of the St. Louis Health Division.

There are two other major public health jurisdictions in the Metropolitan St. Louis Area: the St. Louis County Health Department (adjoining the city on the west, north, and south), and the East Side Health District (serving East St. Louis and other communities on the Illinois side of the river). Over a period of many years rabies in these jurisdictions has followed closely the rabies trends in St. Louis. These adjacent areas also experienced a rising incidence of rabies in 1951 along with St. Louis. While the City of St. Louis showed a dramatic drop in the number of cases in the last half of the year, following the mass immunization, there was no corresponding reduction in adjacent areas, which had no intensive programs. One area showed a moderate rise in the rabies incidence (table 1).

Both the suburban areas did undertake control programs. However, unlike St. Louis, they conducted sporadic immunization clinics, moving from one location to another throughout the respective communities. No attempt was made to have all dogs vaccinated in a short time. The proportion of dogs which were immunized was small and vaccinations were carried out over an extended period. These areas, despite smaller and less dense populations than St. Louis, have continued to have a much higher incidence of rabies since St. Louis's mass immunization program was completed.

Fig. 4. Outside an Emergency Rabies Immunization Clinic at the Cass Avenue Health Center.

Discussion

The experience of other communities indicates that a successful anti-rabies program must: (a) be intensive and of short duration, and (b) result in vaccination of 70% or more of the dog population[4,5]. These criteria were achieved in the intensive campaign in St. Louis; neighboring areas were unable to achieve these objectives. It is understandable, therefore, that reported incidence of canine rabies in these areas continued at a higher level during the remainder of 1951 and throughout 1952.

TABLE 1. Rabies Cases in St. Louis Metropolitan Area by Months for 1950 - 1951 - 1952

	1950			1951			1952		
	E. St. L. Ill.	St. L. City	St. L. Co.	E. St. L. Ill.	St. L. City	St. L. Co.	E. St. L. Ill.	St. L. City	St. L. Co.
Jan.	—	1	—	—	11	5	13	2	12
Feb.	—	—	—	—	29	7	14	4	5
Mar.	—	—	—	1	70	21	31	5	9
Apr.	—	—	—	3	74	45	36	2	8
May	—	—	—	3	79	54	27	1	5
June	—	—	—	2	46	39	17	3	1
July	—	1	—	2	5	14	11	—	5
Aug.	—	—	—	1	1	11	6	1	4
Sept.	1	—	—	4	6	11	12	5	5
Oct.	—	—	—	6	2	8	3	3	4
Nov.	—	3	1	18	4	16	3	2	5
Dec.	—	6	—	9	—	16	2	4	14
Total	1	11	1	49	327	247	175	32	77

In the history of St. Louis, the 1951 rabies epizootic marked the first attempt of large scale vaccination of dogs as a means of breaking the progress of the disease. Quarantine measures had been relied upon in all previous experiences. In all these instances, the reduction of the number of rabid animals was slow and extended over a period of years (fig. 1). The quarantine proclamation was the first control measure used again in the 1951 epizootic. Failure of the quarantine as a control measure was apparent early in the epizootic. It was the addition of immunologic protection that brought the most rapid decline in rabies this city has ever witnessed.

Mass immunization and quarantine accomplished better results in a matter of months than quarantine measures alone had produced in a matter of years. The St. Louis success of a mass vaccination program is similar to the experience of many other American communities[3].

Fagan[6] attributes the failure of quarantine measures to control rabies in this country to the American tradition of freedom of movement for the dog.

While the St. Louis experience demonstrates the inadequacy of quarantining the dog population as a rabies control measure, it also indicates that private practicing veterinarians cannot protect the community against the disease without assistance. McClelland[7] states that the practicing veterinarian is a member of an anti-rabies team. During the St. Louis epizootic, practicing veterinarians once again demonstrated that they are a most indispensable member of such a team. The effective control required the organized effort of the entire community to accomplish the inoculation of so large a number of dogs in the short period needed for a successful immunization campaign. That this intensive character of the program is essential is demonstrated by results in neighboring communities of the metropolitan St. Louis area (table 1).

In December 1952, 18 months after the close of the clinics, there still appeared to be some protection to the dog population of St. Louis (table 1).

The mass inoculation program not only resulted in a 94% reduction in the number of rabid dogs for the remainder of 1951, but also manifested its value by lessening the occasion for the Pasteur treatment following dog bites. A 67% reduction in human treatments was experienced following the canine vaccination program.

Since the dangers[8,9] of the Pasteur treatment are practically an occupational hazard of veterinarians, it is logical for them to cooperate in a well planned community effort of mass inoculation.

Summary and Conclusion

1. Quarantine measures alone failed to control a major rabies epizootic in the City of St. Louis.

2. An intensive canine anti-rabies vaccination campaign produced the most rapid reduction in the rabies prevalence that St. Louis has ever experienced.

3. The program was successful in spite of rabies in the surrounding area.

4. The practicing veterinarians, the City Health Division, and the community organized and worked together as a team for the successful execution of the program in the emergency.

REFERENCES

1. Fredrickson, L., Willett, J., Smith, J., and Price, E., Mass Immunization of Dogs Against Rabies: Its Influence on a Rabies Epizootic in St. Louis. *Am. Jour. Pub. Hlth.*, 43:4 (Apr.), 1953.

(Continued on page 288)

A New Adjuvant In The Diagnosis Of Fish Furunculosis Caused By *Bacterium salmonicida*

P. J. GRIFFIN,* Ph.D., S. F. SNIESZKO,* Ph.D., and S. B. FRIDDLE,* B.S., Leetown, West Virginia

THE degree of effectiveness in the treatment of furunculosis in fish with sulfonamides is increased considerably by as rapid an initiation of therapy as possible. Thus one can readily recognize the importance of rapid and accurate diagnostic measures. Signs and symptoms of furunculosis are protean and occasionally even experienced fish pathologists may not be able to diagnose this disease correctly without isolating and identifying *Bacterium salmonicida*, the etiological agent. A complete bacteriological examination is a time-consuming procedure, consequently an additional aid or adjuvant to diagnosis appears desirable. The present report describes a new presumptive test for *B. salmonicida*. The test is rapid, dependable, and one which can be carried out in the field with a minimum of effort.

The first presumptive test for *B. salmonicida* was introduced by Gutsell and Snieszko†. In this test, a special solid and semisolid medium was inoculated with material removed from the kidney of the infected fish. The development of a brownish-red pigment within two to three days in the solid medium and the absence of spreading growth in the semisolid medium within 24 hours (indicating non-motility), was considered as positive presumptive evidence for the presence of *B. salmonicida*. However, in this test at least 48 hours must be allowed before any conclusive assertions can be made as to incipient coloration or pigmentation and nuances of intensity. Indeed, lack of pigmentation at the end of this time prompts one to withhold even a presumptive statement as to the absence of the disease in deference to the possibility that pigmentation will occur in the medium after a more extended incubation time.

Indication of a more rapid presumptive diagnostic method resulted from observation that coloration or pigmentation of the medium upon which various strains of *B. salmonicida* are grown is the probable result of oxidation of tyrosine or phenylalanine occurring at some point in metabolism of the organism (Griffin, 1952)††. This finding implied that the enzyme tyrosinase was involved in the pigmentation process. Because of this, use of paraphenylenediamine as a test reagent was prompted since the latter substance undergoes a color change in the presence of a certain group of enzymes of which tyrosinase is a member.

Usefulness of paraphenylenediamine as an aid in diagnosis of furunculosis in fish was therefore investigated. A 1% aqueous solution of paraphenylenediamine was freshly prepared and stored in a refrigerator. Twenty-five strains of *B. salmonicida* were grown on trypticase-yeast extract agar.

Composition of medium for *Bacterium salmonicida*: trypticase, 10 gm.; yeast extract, 5 gm.; NaCl, 2.5 gm.; distilled H_2O, 1,000 ml.; pH adjusted to 6.8 with NaOH and sterilized in the autoclave.

All existing data indicate that this is the preferred medium to be used in cultivation of *B. salmonicida* (Gutsell and Snieszko). No evidence of pigmentation of the medium was noted at the end of 18 to 24 hours' incubation time at 22 C. One-half ml. of the paraphenylenediamine test reagent was applied directly to the colonies of *B. salmonicida* growing on the surface of the slants. Tubes were quickly tipped and rotated in such a manner as to allow complete contact of the reagent with all of the growth. Tubes were then placed in test tube racks for further observation. Within 45 to 90 seconds, the surface growth of all strains of *B. salmonicida* tested began to exhibit a color change from that of colorless to a distinct purple. The latter color increased in intensity and within three minutes the colonies turned a deep purple-black. Only the colonies and not the surrounding medium changed color. However, in time a color does develop in the surrounding medium due to diffusion of the reagent.

*Microbiological Laboratory, U. S. Fish and Wildlife Service, Leetown (P. O. Kearneysville), W. Va.

†*Trans. Am. Fish. Soc.*, 76:82, 1949.

††*Bact. Proc.*, 1952, p. 53.

This test was then employed against 56 cultures of bacteria which had been isolated from material taken from various organs and lesions of diseased and dead fish. The identity of some of these microorganisms was known and others were either of unknown genera or species or both; however none of these cultures was characterized as *B. salmonicida*. These microorganisms represented isolates made from fish found in widely different sections of the United States. Cultures of these microorganisms grown for 18 to 24 hours, were tested with the reagent in the manner described. Results are recorded in table 1, an inspection of which indicates that of the 56 cultures tested, the colonies of 31 remained colorless after application of the test reagent and the colonies of 25 cultures did undergo the color change as described for *B. salmonicidia* in a population suspect of furunculosis. were then examined for motility and without exception it was found that these microorganisms were motile. This observation thus served to distinguish them from *B. salmonicida* since the latter is non-motile.

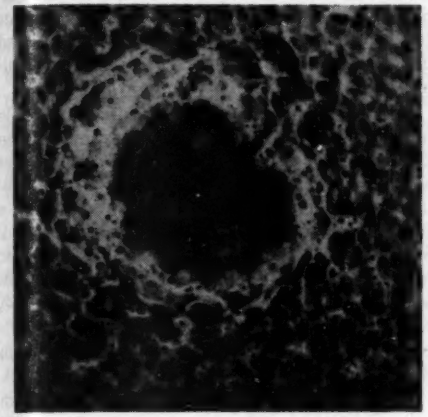

Fig. 1. Cross section of a furuncle in brook trout. Note the bacteria. Magnification 1,000x.

The usefulness of this new test seems apparent, for within 18 to 24 hours or sooner, provided sufficient growth occurs, one can supply a ready answer to the question of the presumed presence or absence of *B. salmonicida* in a population suspect of furunculosis. Failure of the colonies of a particular culture to undergo the described color change quickly eliminates the possibility of presence of this organism. This in itself seems highly advantageous. Those cultures in which the colonies do exhibit a positive color test (*i.e.*, turn a purple-black color after application of paraphenylenediamine) may be easily checked for the presence of motile organisms. Existence of the latter condition then serves to exclude the presence of *B. salmonicida*. The test may offer an additional advantage in those cases of a mixed culture in that it will help to point out those colonies which could be *B. salmonicida* growing among colonies of other types of microorganisms.

It may be advisable to note that although the test had been 100% diagnostic in the writers' hands, this fact in itself does not exclude the probable existence of microorganisms isolated from diseased or dead fish which are not *B. salmonicida* and yet may exhibit a positive color test and which are also non-motile. Another condition with which one may be confronted is the possibility of a mixed culture composed of *B. salmonicida* and other microorganisms which will also exhibit a positive color test. In the event of such a condition, one would of course, be forced to rely on both colonial differences and production of the characteristic red-brown pigment. However, if the present report is a reflection of the general trend, then this new method should retain a measurable degree of value in diagnosis.

In those cases of cultures which are obviously mixed, *i.e.*, contain more than one colonial type, it is advisable to apply the test reagent to the lower half of the surface growth by means of a pipette. Should one or more types of colonies change color, one may then isolate similar colonies from the upper half of the slant and examine this material for motile organisms. This suggestion also accounts for the fact that one may wish to subculture the types undergoing the color change in order to

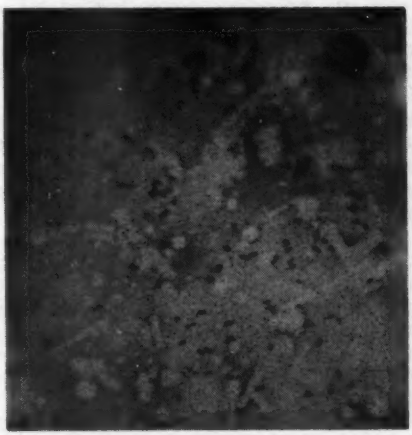

Fig. 2. Stained smear from the kidney of the infected trout. Note the bacteria. Magnification 1,000x.

obtain them in pure culture. An alternative procedure is to select and isolate a colony in the process of changing color. This material may then be used for subculturing. The test reagent will not kill most organisms immediately and the period of time in which viable organisms are still present is sufficient to allow

TABLE 1. Results of Paraphenylenediamine — Motility Tests

Organism	Number Tested	Paraphen. Test	Motility
B. salmonicida	25	+	—
Group I	31	—	±*
Group II	25	+	+

*Motile and non-motile.

for such additional subculturing methods as may be desired.

The test reagent remains stable for at least six weeks if maintained at refrigeration temperature and hence the necessity of frequent preparation is eliminated. Convenience and rapidity of the method described in this report are reflected by the time necessary to complete the entire procedure, approximately five minutes.

Addendum

After preparation of the original manuscript, some additional information concerning the efficacy of this method, as applied under practical field conditions, came to the attention of the authors. Mr. Paul E. Giguere of Cornell University consented to include the new test as a part of his investigations of furunculosis in fish taken from wild waters. His data were most gratifying and are presented below:

"A total of 156 cultures were subjected to the color test. These represented specimens taken from 73 fish. One hundred and thirty-three of these did not give a positive test. Sixteen (representing 13 fish) gave a positive test, but were motile. Seven gave a positive test (representing seven different fish), were non-motile, and were *B. salmonicida*."

These data represent the first practical application of this test in the field and indicate that the proposed method is of definite value.

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Physicians have found that regardless of whether hyaluronidase is used, hypodermoclysis with large molecules, such as glucose, invert sugar, or amino acids, is potentially dangerous. This is particularly true when large volumes are used. Only isotonic solutions containing salt have been found safe.

Cortisone and Hydrocortisone for Small Animals*

A. GRANT MISENER, D.V.M., Chicago, Illinois

Two years ago a 12-year-old castrated male Wire-Haired Fox Terrier weighing 18 lb. was submitted with history and symptoms suggestive of rheumatoid arthritis. Usual treatments for arthritic conditions gave poor results and decision was ultimately made to place the animal on a course of cortisone.

Initial dosage of 50 mg. intramuscularly produced nausea, and dosage was reduced to 25 mg. per day. Results occurred in four days with disappearance of symptoms. The condition recurred in ten months, however, and a second course of cortisone was administered. Symptoms again disappeared, only to reappear in seven months. Treatment again resulted in alleviation, but with subsequent return of arthritis in five months.

Treatment of approximately 50 cases with similar symptoms have given favorable results.

Another use of cortisone is in old dogs with chronic coughs. Treatment of a 12-year-old Manchester Terrier with the usual cardiac stimulants and bronchial sedatives elicited but poor results. Treatment with 15 mg. of cortisone for five days alleviated coughing.

Hydrocortisone acetate (Merck) can be injected directly into the articular cavity of a rheumatoid or osteoarthritic joint. We have found 1 cc. to be effective in the average dog. This drug has been used in three or four animals showing various degree of patellar dysfunction with dramatic results.

▼ ▼ ▼

Just as a deficient record system is a hindrance, so is a bulky one. Many offices are overburdened with a clutter of unwieldy, inconsequential, outdated sheets or cards referred to as a "record system." Whether these pertain to finances, case histories, or any other recordable entity, their relegation to the local incinerator should be considered if they are:

1. Valueless to the business.
2. Not necessary for compliance with state or federal regulations.
3. A duplication of information available elsewhere.
4. Of no historical value.
5. Valueless in the office's public relations program.

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*Presented at the 69th annual convention of the Indiana Veterinary Medical Association, Indianapolis, January 14-16, 1953.

Ideal Topical Anesthetic For Veterinary Use

ALVIN D. KAPLAN, B.A., D.V.M., Arlington, Massachusetts

TO minimize, alleviate, or completely counteract local pain, and thus comfort the patient, should be the veterinarian's first thought. Desirable external medication must be easy to apply, promptly effective, and harmless if ingested. Frequently, improved preparation and method of application are found to be more helpful than new drugs.

The writer has used all available topical anesthetics, in various concentrations and dilutions, but has continued a search for more ideal measures. During study to ascertain potentialities of numerous preparations, americaine®, a proprietary containing 20% benzocaine in dissolved form, was used in numerous cases with excellent results and no toxicity, despite increase of dissolved benzocaine in a water-soluble base.

Relative toxicity of various topical anesthetics is reported by J. Adriani in the Pharmacology of Anesthetic Drugs, 1941. He states that benzocaine (anesthin) is the safest of the group tested.

In this article, advantages of 20% benzocaine ointment and liquid, 20% benzocaine ointment with chlorophyl, and a new 20% benzocaine aerosol will be described for treatment of numerous conditions where alleviation of pain is desired. Americaine contains, in addition to 20% benzocaine, oxyquinoline, a known germicide, fungicide, and bactericide. Ointment containing chlorophyl is ideal where suppuration occurs, acting as a healing agent. It also tends to eliminate obnoxious odors by stimulating cellular metabolism; in this respect it may be said to have antibacterial qualities. Americaine containing chlorophyl is contraindicated in wounds where there is excessive granulation tissue, acute dermatoses, and in all acutely irritated areas where excess stimulation must be avoided. The new americaine spray most recently employed has shown remarkable anesthetic possibilities.

In addition to its relative freedom from toxicity, it should be pointed out that in the present series, not a single case of sensitivity or allergic reaction was noted. This suggests that except in rare instances of sensitivity, americaine ointments and liquid may be used routinely whenever conditions of surface pain and itching are encountered. The preparations have the added advantage of being easy to apply, even in sensitive regions, thus making them excellent in emergencies.

Case Reports

Case 1. A two-year-old mongrel terrier was brought to the office by its owner. About 75% of the cuntaneous area, including back, chest, groin, and thighs was raw, inflamed, or abrased by constant scratching. Microscopic skin scrapings, fungus tests, etc., proved to be negative. With the history of previous occurrence the year before for a short period of time, tentative diagnosis of non-specific allergic reaction was made. Immediate alleviation of intense itching was required. Americaine liquid topical anesthetic soaked into thickly padded cotton applicators was slowly and thoroughly applied to the entire raw area. At first contact with an abrased surface, there seemed to be a slight burning sensation but soon afterward anesthetic properties became evident. In this case, control of itching and surface pain was quite evident; the animal began to rest easily and did not mind further examination of inflamed and raw areas. A quantity of the liquid anesthesia was dispensed with instruction to apply as indicated for relief of itching. One week later the owner reported that the dog was much more comfortable and that affected areas were improving rapidly.

Case 2. A one-year-old castrated male mongrel was presented for treatment of general widespread abrasions in the region of the stifle joints. This animal had been running along a rocky ledge and on attempting to climb had slipped and had been badly bruised. Continuous licking was resulting in inflammation. A fine spray of americaine topical anesthetic liquid was applied via aerosol dispenser. Within a brief period, the quick anesthesia permitted the animal to rest easily while the areas were washed and ointment applied. The dog was dismissed and the client given a tube of americaine ointment for home application.

®Arnar-Stone Laboratories, Inc., Evanston, Ill.

Case 3. A two-year-old male terrier was brought in after having been kicked above the left eye by a horse. Fortunately, the blow was light for the only evidence of the accident was a gash requiring three silk sutures. In preparation of the patient for suturing, excellent anesthesia was obtained by waiting 15 minutes after a topical application of americaine ointment, the quiet behavior and minimum restraint necessary demonstrating anesthetic properties for minor surgery. The dog was dismissed immediately and the owner was advised to apply the anesthetic ointment dispensed as required to prevent the animal from irritating the wound and removing the stitches. Final results were both excellent and gratifying.

Case 4. A two-year-old male Cocker Spaniel with a history of continually dragging his hindquarters on the floor and licking the anal area for weeks, was presented for examination and treatment. The left anal gland was swollen, raw, and inflamed. After lancing and expressing the contents of the gland, americaine ointment was applied into the incision and rectum. The other gland was easily expressed and the patient dismissed with instructions given to the owner to continue application of ointment as needed.

Case 5. A four-year-old male tiger cat was examined after the owner realized necessity for professional advice following a period of unsuccessful home treatments. Shaving hair from an infected area about the neck revealed the presence of a circular gangrenous mass having a diameter of 1.5 in. An americaine-chlorophyl pack was applied and after 24 hours the cat was placed under general anesthesia to permit removal of necrotic tissue. For the following three days, ointment packs were applied. During this period the cat was comfortable. On the fourth day, the process of healing was advanced and the patient discharged. Packs were changed daily until healing was assured. Americaine ointment with 20% benzocaine is safe to use in cats.

Case 6. A 14-year-old spayed mongrel was presented for removal of a large tumor. The owner was advised that surgery was necessary and, considering the animal's age, dangerous. Following the general preparation and procedure of removing the mass, numerous interrupted sutures were necessary. The dog made a rather remarkable recovery but soon after dismissal the owner advised that the dog was continually licking the bandage and irritating the healing incision. Americaine ointment with chlorophyl was applied with a pack which afforded immediate relief as evidenced by willingness of the patient to ignore dressing. Daily applications were continued, with the final result that the wound healed satisfactorily.

Case 7. A three-month-old female Spitz was presented for treatment after having eaten chicken bones the day before. The client advised that many splinters had been passed in numerous loose bowel movements. The animal was eating well and not vomiting. On palpation, no evidence of splinters or foreign matter in the rectum was found, but there were lacerated areas immediately anterior to the rectal orifice. Americaine ointment applied with rectal applicator anesthesized the mucous membrane enough to allow comfort. This agent was dispensed for home treatment. Treatment was discontinued in seven days and uneventful recovery followed.

Conclusion

The above are but a few cases taken from numerous filed histories substantiating the value, excellent results, and non-toxicity of the new preparation, 20% benzocaine americaine.

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Feline Onychectomy*

A. GRANT MISENER, D.V.M., Chicago, Illinois

Declawing the forefeet of cats to prevent damage to household goods is not a new operation. One veterinarian in the Chicago area has been performing it for 30 years. When properly executed, it is a surgical procedure for which the average owner is often extremely grateful. It may mean the difference between keeping the cat or disposing of it because of destructive habits.

Surgery is performed under general anesthesia. Forefeet are cleaned, disinfected, and a tourniquet is applied to the forearm, and left in position to prevent excessive hemorrhage. A sterilized Resco nail trimmer is applied well down on the claw so that the distal portion of the third phalanx is removed. The procedure is then repeated on the opposite foot and both are bandaged. Dressings are left in place for 48 to 72 hours and are not replaced.

Surgery is recommended only on forefeet and does not prevent tree climbing. It may be necessary to reoperate if all the corium is not removed because, in these cases, claws develop which are abnormally shaped. There is little danger of infection and recovery is prompt.

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*Presented at the 69th annual convention of the Indiana Veterinary Medical Association, Indianapolis, January 14-16, 1953.

EDITORIAL COMMENTS

Outbreak of Foot-and-Mouth Disease in Mexico

An outbreak of foot-and-mouth disease was reported from Mexico on May 23, 1953, just two days after an alert owner first observed and reported suggestive symptoms in his herd. This marks the first appearance of the disease in that country since August 1951, when infection was diagnosed near Nautla, Veracruz. Four herds of cattle, totaling 450 to 500 head, were initially involved. Later, intensive inspection has placed the number of infected and exposed animals at approximately 700 head. This affected area, some 375 miles south of Brownsville, Texas, has been marked out into an inner and outer zone of quarantine. Infection has been found to date only in the inner zone, having a diameter of 12 miles, though all animals in both zones are being inspected daily.

Veterinarians of the Mexican-United States Joint Commission moved into the area promptly for disposal of all infected and exposed animals and for daily inspection of premises within defined areas and less frequent examination of outlying ranches and farms. Test indicated the infection to be type A, or that prevalent in Mexico from 1946 to 1951; origin has not been determined. About 21 months have elapsed since the last evidence of the disease was eradicated. The virus has not been known to exist outside of host animals for longer than a year. This suggests probability of infection among wild life of the region.

Secretary Benson closed the Mexico-United States border to import of susceptible animals and their products immediately, as required by the Tariff Act of 1930. Canned meat still may be imported without further restriction. An idea of international border activities, since lifting the ban on imports last September, is contained in news releases of the Department of Agriculture. Some 272,000 cattle have been imported through all stations during the last nine months. None have been accepted from the former quarantine zone; only those from the northern Mexican states have been permitted entry.

Concern over this most recent outbreak is tempered by the readiness of joint eradication forces still in Mexico. Trained crews of veterinarians and technicians are available to confine the infection — which was not the case in 1946. However, special measures are necessary because of the present widespread incidence of vesicular exanthema in swine in the United States. Dangers of confusion of these vesicular diseases, in event of an outbreak in the United States, do exist because of similarity of lesions.

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Verminous Bronchitis Serious Parasite of Cattle

Verminous bronchitis is one of the serious hazards of raising cattle. These parasites are prevalent in the naturally warm, moist regions of southern United States, as well as on irrigated farms having an equable climate. In cattle, the parasite is the *Dictyocaulus viviparous;* in sheep it is the *D. filaria* and in swine it is the *Metastrongylus elongatus,* a white thread-like worm 2 in. to 3 in. long. The eggs are produced in the air passages where they are usually embryonated to be coughed up, swallowed, and eliminated in the feces to develop in about a week to the infective stage. The cattle lungworm larvae do not pass through the earthworm as happens in the development of the swine lungworm. After reaching the digestive tract, the larvae penetrate the intestinal wall to finally reach the lungs. In the lungs, the parasite irritates the bronchial mucous membrane so that there is produced a cough, the severity of which increases as there are small or larger numbers of these nematodes. There may be blocking of the bronchioles, marasmus, and death. Calves and young cattle are more frequently infected than are older animals.

There is no recognized treatment of value at this time so that dependence for control rests on drying up irrigated pastures, an almost impossible thing to do in the case of naturally low wet areas, and leaving them without cattle for an extended period. The cattle owner having only comparatively small pasturage, is in for a loss if he dries up the pasture and keeps the cattle off or if he continues to graze the infested pastures. It is a serious problem in some regions.

ACTH and Cortisone for Bovine Ketosis

The question as to whether cortisone therapy may be considered replacement therapy and ACTH stimulative therapy is an academic one. Our studies show that neither the pituitary body nor the adrenal glands of ketotic cows can be considered normal. Adrenals in these animals are sufficiently operative to respond to ACTH to the extent necessary to promote recovery; they do not respond as well as adrenals of normal cows, however. The pituitaries of ketotic cows do not respond to stress or to stimulants such as epinephrine. Therefore, ACTH administration may be considered both replacement and stimulative therapy. Cortisone injection, of course, must be considered replacement therapy, although some effects are stimulative in cows suffering ketosis which have not been observed in normal cows. For example, ACTH produces substantial increase in blood sugar in normal cows, whereas cortisone does not. On the other hand, cortisone elicits marked increase in blood sugar in ketotic cows.—*J. C. Shaw, Ph.D., professor of dairy husbandry, College of Agriculture, University of Maryland, College Park.*

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Symphyseal fractures of the mandible, often inadequately fixed by figure-eight wiring of lower canine teeth, can be reduced by incising the skin on the median line under the jaw, exposing the rami, and carrying a large needle with no. 36 wire, nylon, or silk around the ramus laterally and out through the gum line near the canine tooth on the same side. The needle is then carried so that the suturing material bridges the mouth and is reintroduced into the gum on the opposite side. The material is then tied in the area of the skin incision. The method is applicable for both dogs and cats.—*R. L. Rudy, D.V.M., Columbus, Ohio.*

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Intravenous injection of sterile solution of phenylmercuric nitrate (phe-mer-nite 1:1,500®) is employed with intramuscular injection of antibiotics in the treatment of leptospirosis in cattle. To my knowledge, this is the only such preparation suitable for intravenous administration in these animals. It has proved to be relatively non-toxic.—*J. G. Hardenbergh, D.V.M., Rockton, Ill.*

®S. E. Massengill Co., Bristol, Tenn.

A. M. A. on Trichinosis

An editorial in the *Journal of the American Medical Association* (152:241 [May 16], 1953) reports appalling incidence of trichinosis in man, and outlines important control measures.

Recent figures submitted to the Association indicate that one out of every six persons in this country, a total of 25,000,000, are infected with *Trichinella spiralis*. Approximately 35,000 persons acquire infection annually, and 16,000 demonstrate detectable symptoms. Of this latter group, 5% die of the disease.

Two control measures are discussed in the article: prevention in man by proper cooking methods, and prevention in swine. These measures would be accomplished by: (1) Passing garbage-cooking requirements, (2) enforcing existent prohibitions against interstate shipment of uncooked garbage, (3) prohibiting swine shipment from non-conformant states, (4) educating the farmer to eliminate raw pork from swine diets, (5) disseminating garbage-disposal information, (6) prohibiting sale of garbage-fed hogs to plants lacking adequate inspection service, (7) continuing education of the public in methods of cooking pork, (8) promoting further research on methods of eliminating Trichinella from carcasses, and (9) improving diagnostic methods for both man and hogs.

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The Hump of the Zebu

Humped Indian cattle and their crosses are in favor in southern and southeastern cattle raising sections of the United States. The characteristic and remarkable hump situated dorsal of the forelegs has been known for centuries, yet there appears much misconception about its structure and significance.

B. Thorpe discusses the anatomy of the part in *The Australian Veterinary Journal* for March 1953. He states in part that, "The hump of the Zebu consists entirely of the rhomboid cervical muscle. The fibres of the dome shaped mass run in a curved anteroposterior manner. Muscle bundles originate at the mid-dorsal vertical plane by their connection with those of the other side. There is a fibrous connection at the midline between the right and left splenius muscle. Caudally, it is attached by fibrous strands to the supraspinous ligament over the 2-5th thoracic spines, which helps to anchor the whole mass."

Not Yet a Historical Disease

There are those who believe that brucellosis of man and animal will be merely of historical interest in the near future. Before accepting such a belief, it is necessary to examine the facts. Although vaccination is having great success in reducing the incidence, complete eradication is likely to be difficult. Antibiotics are too expensive for widespread veterinary use and some experience indicates that they can not be relied upon to eliminate the infection from the body.

Even in the face of efficient pasteurization, there is danger of man contracting the disease through contact with discharges. There can be little doubt that the three main varieties of Brucella originated from a single stock; if this is accepted, what is there to prevent new varieties arising or the conversion of one of the existing varieties into another in a given area? Aberrant strains have been known for a very long time.

It is obvious that in the future we may find we have a more virulent variety of Brucella than the comparatively benign abortus to which we have been accustomed. — *W. Dalrymple-Champneys, Vet. Rec.*, 7:99 (Feb.), 1953.

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"Coon Dog Paralysis"

"Coon dog paralysis" is the name given a paralytic syndrome seen in Ohio animals since 1951. Fred J. Kingma described the disease as appearing in dogs two to nine years of age, largely in males, and characterized by generalized paralysis. Laboratory work, physiological studies, autopsies, and animal inoculation have failed to determine the cause.

The paralytic syndrome is without temperature, inappetance, morose, or morbid symptoms at any time. Histories reveal that dogs have suffered from bites inflicted by racoons five to eight days previous to onset. Prognosis is good, and if paralysis is not severe, recovery occurs in eight days. More severe cases remain paralyzed almost completely for ten weeks. Although not possible to effect etiological treatments, Doctor Kingma recommends the following measures:

1. Prevention of muscular atrophy by physiotherapeutic measures such as massage, inductothermy, and hydrotherapy, and administration of parasympathicomimetics.

2. Symptomatic treatment as necessary, particularly in reference to the urinary and digestive systems.

A.V.M.A. Toronto Meeting

Dr. E. Rendle Browness, general chairman of the Committee on Local Arrangements, has extended a personal invitation to all veterinarians and their families to visit in Canada July 20-23, 1953.

A scientific program, developed with the assistance of international authorities, promises

Dr. W. L. Boyd

outstanding literary sessions in each of six sections. These include general practice, research, small animal, surgery and obstetrics, poultry diseases, and public health. President W. L. Boyd will preside at this meeting.

Sixty-seven commercial exhibitors have arranged to display the latest developments of the laboratory. Among these, one will be able to observe new instruments, appliances, and therapeutic agents. Each of these exhibitors will have well-informed persons in attendance who will be able to answer questions.

Again this year Allied Laboratories, in cooperation with the Radio Corporation of America, will sponsor the closed-circuit television portion of the program.

Entertainment attractions include a planned golf tournament, a baseball game, alumni dinners, and a president's reception and dance. In addition, a special program has been arranged for the ladies and for teenagers.

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A survey (*Brit. Med. Jour.*, April 4, 1953) of prescriptions has shown that half of all the prescriptions written by British physicians were for symptomatics unlikely to alter the basic cause of disease. "It can hardly be doubted that large quantities of drugs are being prescribed as placebos, which of course may often be justified." The report continues: ". . . quite apart from the expense, placebos may do actual harm to the patient . . ."

Old Age a Disease

The old-age problems of human beings are similar to those of aged animals. The *Journal of the American Geriatrics Society*,* in an article concerned with surgery on the aged, contains information pertinent to the veterinary surgeon. The following is an adaptation of the article to old age in animals.

It has been said that old age is a disease. It attacks under the guise of cardiac insufficiency, chronic nephritis, ascites, prostatitis, arthritis, cancer, blindness, and so on. The veterinarian who is called to attend an aged surgical patient usually finds not only the immediate condition to circumvent, but also a train of purely organic ones that may defeat his skill as a surgeon and therapist.

Surgical advances have made surgery relatively safe for the aged patient. All that remains is to make the patient safe for surgery. This is accomplished by restoring lost vitality and reviving functional activity. The ennervated condition of the patient must be considered, surgical risk minimized, and complications averted.

The objectives of pre-surgical preparation in the aged are: (1) to overcome dehydration; (2) to overcome toxemia; (3) to obviate nutritional faults; (4) to overcome anemia; (5) to check bacterial activity; and (6) to treat concurrent diseases (cardiac, renal, prostatic).

During surgery on the aged, it is well to institute: (1) gentle handling of tissue; (2) careful hemostasis; (3) fluid administration; (4) proper choice of operative site; and (5) careful suturing of the wound.

Many post-surgical dangers are apt to confront the surgeon, and some of these are: (1) hemorrhage; (2) hepatic or renal failure; (3) embolism; (4) pneumonia; (5) shock; and (6) infection.

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Dr. Wm. E. Petersen, professor of dairy husbandry, University of Minnesota, St. Paul, presented a discussion on mastitis at the Northern Illinois Veterinary Medical Association. He outlined what was termed the best mastitis therapy: First, drain the udder thoroughly by hormone stimulation of lactation, accomplished by intravenous injection of extract of the posterior pituitary gland; then treat with massive doses of aqueous solutions of antibiotics injected into the udder and repeated as necessary.

"We have always thought that the major value of obtaining a laboratory diagnosis in poultry diseases is to determine what problems have been causing trouble so that you may lay more effective plans to avoid a recurrence . . .

"Taking birds into the laboratory has a double advantage: you may determine what the problems are on your farm; and you may discuss with capable and interested veterinarians what you might do to treat the birds, and what you may do to prevent further problems."—*Poultry Digest, Jan. 1953.*

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Because parasites have reduced their organs in the process of evolution, their history is obscure. We have thus been deprived of fossil remains that might offer evidence of their past. Several fossil nematodes have been found, however.

It is possible to trace their ancestry since the time of the Egyptians, who mentioned tapeworms, bloodflukes, and hookworms in 1600 B. C. The Chinese described malaria centuries ago, and the Persians, filiariasis and hookworm in A. D. 980. The body of recently exhumed mummies have revealed *Schistosoma hematobium* in the kidneys and lice on their skins.

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Rabies Controlled

(*Continued from page 279*)

2. Andrews, C., Adventures Among Viruses: I. Some Properties of Viruses. *New England Jour. of Med.*, 242:161 (Feb. 2), 1950.

3. Steele, J., and Tierkel, E., Rabies Problem and Control. *Pub. Hlth. Repts.*, 64:785 (June 24), 1949.

4. Tierkel, E., Some Epidemiological Considerations in the Control of Rabies. Proc. U. S. Livestock Sanitary Assn. Report of 55th Annual Meeting, (Nov.) 1951, pp. 98-101.

5. Tierkel, E., Some Factors in the Appraisal of Rabies Control Methods. Proceedings Book, 89th Annual Meeting of the Am. Vet. Med. Assn., June 1952, pp. 415-416.

6. Fagan, R., Rabies, an Epidemiological Analysis. Proceedings Book, 89th Annual Meeting of the Am. Vet. Med. Assn., (June), 1952, pp. 394-407.

7. McClelland, R., The Practitioner's Viewpoint of Public Health Authorities Appraisal of Rabies. Proceedings Book, 89th Annual Meeting of the Am. Vet. Med. Assn., (June), 1952; pp. 415-416.

8. Pait, C., and Pearson, H., Rabies Vaccine Encephalomyelitis in Relation to the Incidence of Animal Rabies in Los Angeles. *Am. Jour. Pub. Hlth.*, 39:875 (July), 1949.

9. Koprowski, H., and LeBell, I., The Presence of Complement-fixing Antibodies Against Brain Tissue in Sera of Persons Who Had Received Antirabies Vaccine Treatment. *Am. Jour. Hyg.*, 51:292 (May), 1950.

*Jour. Am. Ger. Soc., 1:57 (Jan.), 1953.

PRINCIPLES OF ANIMAL HEALTH

R. R. DYKSTRA, D.V.M.
Manhattan, Kansas

Contaminated Water Supply

Livestock owners are increasing the parasite hazards in animals by permitting drinking of water from the common ponds. Because of drought conditions, it is not uncommon for small dams to be built across draws to form ponds and thus conserve moisture. These frequently are contaminated by cattle and other animals having access to them by the deposit of fecal and urinary discharges. Many veterinarians are recommending that these watering places be surrounded by fences so as to make them inaccessible to animals and the water piped to a nearby tank from which it can be consumed with comparative safety from parasitic contamination.

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In regard to the livability of newly born pigs, veterinarians have been almost swamped by advice about remedies, sanitation, and a host of prophylactic and curative measures. Many of these are to an extent sound and certainly helpful. Though diligently applied, they have not been as successful as desired by the animal husbandman. The writer has, during recent months, been impressed by the work of some research agencies which have approached this situation from the standpoint of maintaining a high nutritional state during fetal life. One researcher states "Pigs born nutritionally healthy, seldom die." On the foregoing basis, it has been reasonably well determined that if there is added to the ration of pregnant sows, access to green pasture, 2 mg. of vitamin B_{12} for each 100 lb. of feed, 2% fish solubles, riboflavin, niacin, whole dried liver, and calcium pantothenate, the livability of pigs may be raised to as high as 85%.

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Jordan, of the South Dakota Agricultural Experiment Station, in his research project relative to the addition of aureomycin to the ration of fattening lambs, concludes that the stimulation of feed consumption was not observed to the same extent as in swine; that in the dosage used (14.4 mg. per lamb daily), it reduced the rate of gain and feed efficiency; and that in the dosage fed, aureomycin did not give complete protection from enterotoxemia, "but it did reduce it materially."

Toxicity of Salt

The toxicity of salt added to the diet of young chickens (about one month of age) has been a research project in Great Britain. In concentrations of somewhat over 3%, continued for three weeks, there were no noticeable undesirable effects, though consumption of water was increased. When the salt concentration was gradually increased up to almost 8%, there were fatalities, preceded by drowsiness, gaping, and inability to stand. General edema, cardiac hypertrophy, and congested kidneys, with hypertrophy of the glomeruli, were postmortem lesions observed.

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Dr. O. W. Schalm, School of Veterinary Medicine, University of California, Davis, presented a discussion entitled The Mastitis Complex, at the Annual Conference of Veterinarians, University of Pennsylvania, Philadelphia, Jan. 6-7, 1953. An abstract appears in the *Veterinary Extension Quarterly* for April 17, 1953. In this, he stated: "Satisfactory control of mastitis may be attained ordinarily by (1) milking cows in sequence according to age or knowledge of udder infections, (2) proper sanitation and milking technic, and (3) judicious use of mammary therapy." However, in regard to mammary therapy, he stated: "Failure to employ an aseptic technic in administration of intramammary infusions against pathogenic cocci may result in the establishment of bacillary infections, such as *Escherichia coli, Aerobacter aerogenes,* and the refractory *Pseudomonas aeruginosa;* furthermore, observations thus far tend to suggest that, in some manner, the elimination of these cocci through vigorous segregation, accompanied by intramammary therapy (blitz method), increases the susceptibility of the udder to bacillary invasion."

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In the *Journal of Animal Science* for November 1952, there is a report of research regarding vitamin E deficiency in lambs. There is a generally prevalent theory that stiff-lamb disease is a vitamin E deficiency, but this particular project demonstrated that factors other than vitamin E deficiency alone may be involved.

PUBLIC HEALTH

JAMES H. STEELE, D.V.M., M.P.H.
Atlanta, Georgia

Salmonella Infections from Dried Egg Yolk

Additional reports have been received showing that dried egg yolk presumably has been responsible for diarrhea in infants. An infant living on Long Island, N. Y., was fed dried egg yolk early in November and developed diarrhea on November 16. A Salmonella organism, type not yet determined, was recovered from the stools. *Salmonella montevideo* was isolated from the stools of an infant in Cincinnati, and from a specimen of the egg product.

Thirty-one cases of diarrhea in infants alleged to be due to dried egg yolk have been reported in Indiana. *Sal. montevideo* was isolated from five samples of the product, and presumptively, in two others. Three of the five positive samples have been directly connected with babies who ate them, as stool specimens from these infants have demonstrated the presence of the same type of organism. Two cases in infants in Chicago were fed the egg yolk prior to illness; two in Denver who had ingested this food were found with Salmonella type C infections; and one additional case in Oregon has been reported. One case has been reported in Frederick, and one in Salisbury, Md. Stool examinations revealed *Sal. montevideo*. It was stated that egg yolk had been eaten three days previously, but none was left nor available for laboratory examination. Two suspect cases have also been reported in Maryland.

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Leptospirosis

The Iowa Department of Health recently reported two cases of leptospirosis in man due to *Leptospira pomona*. One of these patients was a veterinarian who had treated several suspected cattle herds.

There has been an increasing prevalence of leptospirosis among domestic animals since the close of World War II. More than 30 states have reported the identification of *L. pomona* outbreaks in cattle. A number have also reported the disease in swine and horses. Recently a sizeable outbreak of leptospirosis in man was reported in southeastern United States which was attributed to *L. canicola*.

The report of *L. grippo-typhosa* in Texas raises another problem. This species is the agent which has been described in eastern Europe, Israel, and Russia, as the cause of bovine and human disease. In 1950, over 1,000 human cases of *L. grippo-typhosa* were described in Israel.

Another Leptospira type found in the United States was recently identified by Gochenour and Yager of the Army Veterinary School as *L. autumnalis*. This organism was the cause of "Fort Bragg fever" for which no etiological agent was isolated for almost ten years following its first occurrence in North Carolina.

It should be borne in mind that the prevalence of *L. icterohaemorrhagiae* has not declined during the past eight years. At a recent symposium sponsored by the Walter Reed Army Medical Center one of the participants stated that he believes there are about 15,000 human cases annually. He compared the infection with brucellosis and typhus and pointed out that the diagnosis is often missed.

An illustration of the difficulty of diagnosis is a case that occurred in a packing house worker in an eastern state. The man was employed on the killing floor of a local packing plant. He developed a subacute illness that had him in and out of hospitals for months. The attending physicians thought he had brucellosis, but when they failed to demonstrate any evidence he was then described as having psychosis. At another hospital leptospirosis was suspected and confirmed. The same story has been reported in other parts of the country among packinghouse workers and veterinarians.

I am of the opinion that within the next few years leptospirosis will become one of the more important veterinary public health problems. There is considerable evidence that it is already an important economic problem. To ascertain the role of leptospirosis, it is imperative that our medical colleagues be acquainted with this disease and how it is spread from animals to man. Both health and agriculture agencies should establish diagnostic facilities to assist physicians and veterinarians in identification.

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Fluorosis in cattle may be manifested by excessive hoof development and discoloration of teeth.—*Prof. Paul H. Phillips, Madison, Wis.*

POULTRY PRACTICE PROBLEMS

W. R. HINSHAW, D.V.M., Ph.D.
Frederick, Maryland

Leucocytozoan Infection in Ducks

In studies on epizootiology of *Leucocytozoon simondi* infection in ducks Chernin (*Am. Jour. Hyg.*, 56:39, 1952) observed that ducks reared naturally on northern Michigan farms seldom suffered from the disease in late June or early July. In contrast, few escaped infection in late July or early August. It was observed that exposure of six-week-old ducklings to natural infection under ordinary farm conditions for eight-day periods in late June or early July failed to cause high rates of infection, and that few infected birds succumbed. When ducklings were exposed during the period from July 11 to August 4, infections were rapidly acquired with high rates of morbidity and fatalities. Exposure after mid-August resulted in no infections.

Also of interest were increased mortality rates of ducklings introduced as transients as compared to indigenous farm birds. The author suggests that indigenous birds exposed to infections early in summer probably received mild infections which rendered them immune to heavier dosages of parasites in mid-summer. From a management standpoint these findings indicate that prevention of excessive mortalities could be accomplished by securing replacements early in the season.

There appeared to be an age resistance factor for ducks 18 weeks of age or older, but not in younger birds. The protection against fatal dosage exposure in the latter appeared to be entirely due to acquired immunity. No difference of susceptibility of sexes was noted.

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Round Heart Disease

A disease, called "round heart disease" in Europe, has apparently not been recognized in the United States. It is important enough in Europe to have warranted a considerable portion of the program of the disease section of the 8th World's Poultry Congress being devoted to it (Proc. 8th W.P.C., Copenhagen, 1:687, 1948).

The disease appears most often in young birds; incidence in females is greater than in males, though both sexes are affected. According to Luke (Proc. 8th W.P.C., 1:692, 1948), the disease is characterized by sudden death without previous clinical symptoms other than depression preceding death in a small percentage of birds. As a rule, birds are in good flesh condition at death. Necropsy findings include pale pectoral muscles and an enlarged heart which is bluish-pink, the muscles of which have a spongy appearance. The normal tapering contour of the organ is lost and the ventricular part is rounded in outline. There is an excess of pericardial fluid and usually the heart is encased in a jelly-like yellowish clot. The primary lesion is cardiac and other changes are probably secondary to failing circulation. Other lesions include excess of abdominal fluid, edema of lungs, and a yellowish jelly-like deposit over the ventral surface of the liver.

The disease has been described in Germany, Denmark, Ireland, Scotland, England, and in New Zealand. It has existed in Denmark since about 1936. Mortality figures quoted by Luke, based on 82 outbreaks in 7,000 birds, are 14.9% in 1946 and 16.1% in 1947.

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I would like to comment on the report of isolation of the causative agent of infectious sinusitis of turkeys from pigeons by Winterfield (*Vet. Med.*, 48:124 [Mar.], 1953). This report is a most valuable contribution in that pigeons have been added to the list of possible carriers of this agent. Winterfield's findings may help to explain otherwise undetermined outbreaks. Pigeons are notorious for their invasion of poultry and turkey yards and ranges, and proper control of them may prove to be an important factor in prevention of the disease in both chickens and turkeys. Several years ago in one area in California, sparrows appeared to be a source of the infection in turkeys but actual isolation of the causative agent was not accomplished. I believe that careful surveys of the wild birds frequenting infected poultry and turkey farms should be made to determine other species that might also be carriers.

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The average prewar consumption of turkey per person was 2.5 lb. In 1940, it was about 3.5 lb. per person, and in 1951 the average was 5.25 lb. It is predicted that there will be consumed in 1952 an average of 6 lb. per person.

ABSTRACTS OF LITERATURE

Urinary Calculi in Wethers and Steers

Results of experiments conducted at the State College of Washington[11] indicate that high phosphorus content of rations in proportion to calcium is the primary cause of the production of urinary calculi in drylot fed male animals.

In tests of a group of 48 wethers fed a basal ration supplemented with adequate vitamin A and D and a variety of mineral mixtures, it was learned that blood levels of calcium, phosphorus, and magnesium were unchanged by additions of the minerals to the basal ration. Neither were levels of these salts increased in the urine. A calcium phosphorus ratio of 0.5:1 produced a significantly greater number of calculi than a ratio of 1.25:1 under the conditions of the experiment.

The authors state that practical feeders are in accord with the theory that a high proportion of phosphorus to calcium in the ration is the primary cause of calculi formation. This occurs most frequently in castrated animals fed large amounts of concentrate in the dry lot. Both steers and wethers consume rations consisting largely of roughages, usually containing adequate calcium, in the early part of their lives; when these animals are taken from pasture to feed lot, the proportions of mineral intake frequently are reversed suddenly. Concentrate mixtures made up of grain, milling by-products, and high protein supplements are all high in phosphorus and low in calcium. Fattening animals consume liberally of these concentrates even though roughages are available. Thus, phosphorus intake is increased, calcium decreased.

Emphasis is placed on the optimum and well-established C-P ratio. To accomplish this, it is suggested that only ground limestone (calcium carbonate) and not steamed bonemeal be used as a mineral supplement for fattening rations.

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A bill prohibiting the use of virulent hog cholera virus after January 1, 1955 for immunization of swine passed the Illinois legislature.

[11]Schneider, B. H., Taysom, E. D., and Ham, W. E., Urinary Calculi in Male Farm Animals (Preliminary Report). Circular 203, Washington State College Experiment Station, Pullman.

Atabrine Therapy in Human Taeniasis*

Quinacrine hydrochloride, atabrine® dihydrochloride was employed extensively during World War II for suppression and therapy of malaria among troops in the Southwest Pacific theater of war.

Recently, workers in Chile[12] reported on the use of this drug as an anthelmintic. They claim that of 30 human patients infected with *Taenia saginata, T. solium,* and *Hymenolepis nana* who were treated, 25 expelled tapeworms with resulting clinical improvement, referred to as complete cures.

The authors outline a technic for preparing patients. This includes giving a low-residue meal 24 hours preceding therapy and the administration of seven to nine tablets (0.1 gm.) divided into two parts; *i.e.,* five or six tablets for the first dose and two or three on the second, one hour later. Three hours after the second dose a laxative, either saline or oil, is given.

Editor's Note. The question has been posed in reference to efficacy of atabrine for the removal of tapeworms in dogs. Dr. R. D. Turk, head, Department of Parasitolology, Texas A. & M. College, College Station, advises that a few dogs were treated with 0.1 gm. (1.5 gr.) of atabrine daily, for five days, for giardiasis. Results were reported as unimpressive, but no toxic symptoms were noted. Another source reports extreme toxic reactions in dogs. Further studies will be required to assess the possible value of this agent as a taenicide.

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Anesthesia of the Retractor Penis Muscle

Inspection of the bull's penis, important in control of trichomonas infection, presents difficulties because of anatomical structure. Epidural anesthesia sufficient to effect relaxation of the parts may cause the bull to fall with resultant injuries, dislocations, or bloating. The

*We are indebted to Mr. Julio Reyes G., sophomore veterinary student from Mexico at Texas A. & M. College, College Station, for translation of the original paper.

®Winthrop-Stearns, Inc., New York, N. Y.

[12]Neghme, A., and Faigenbaum, J., Nuero Modalid de Tratamientaen las Teniasis (Trans. A New Method in Taeniasis Treatment). *Rev. Med. Chile,* 75:54, 1947.

same may occur with casting or general anesthesia.

Detailed experiments in Germany[18] have resulted in development of a method of blocking

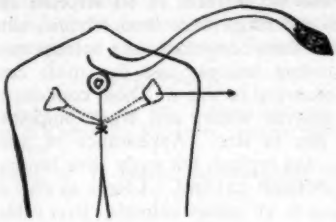

Fig. 1. Schematic drawing indicating relation of parts to site of injection (x).

the external pudic nerve, which controls the retractor penis muscle.

Procedure. 50 to 70 cc. of a 5% solution of tutocaine (similar to procaine hydrochloride), warmed to body temperature, are employed. A 2% solution has proved too dilute for effectiveness. The anesthetic is injected aseptically and slowly with a 4-inch,

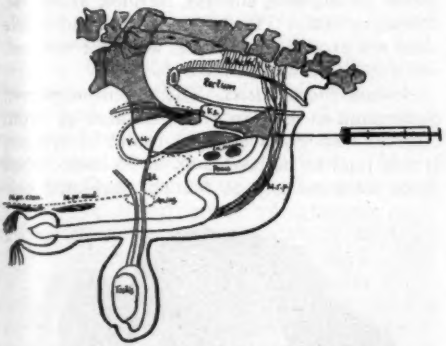

Fig. 2. Illustration of site for deposition of anesthesia to facilitate examination of the penis. Legend: V. s. — seminal vesicles; V. u. — urinary bladder; D. d. — ductus deferens; M.r.p. — retractor penis muscle; M.pr.cran. — anterior, and M.pr.caud. —posterior preputial muscles; . . . . —peritoneum; R.Gekr. — epirectal fat; An. Ing. — inguinal ring.

18-gauge hypodermic needle. The needle is inserted for two to two and one-half inches into the midline, four inches below the anus, until the rear edge of the bony pelvis is touched. It is then withdrawn for half an inch and the contents of the syringe injected slowly. Invasion of a blood vessel is tested by negative syringe pressure. Should blood appear in the syringe, the needle is withdrawn slightly and directed about one inch laterally from its original path.

After withdrawal of the needle, the site of injection may be covered with tincture of iodine or flexible collodion. Anesthesia becomes apparent in 15 to 20 minutes. The penis usually prolapses from the sheath by itself, or it may be aspirated by means of a piece of wide rubber tubing, attached to a stomach pump. — *Peter W. Ucko, D.V.M., Clinton, Iowa.*

[18]Mundt, Anesthesia of the Retractor Penis Muscle. (Trans.) *Der Prak. Tierarzt,* 4:65 (Apr. 1), 1953.

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Lower animals are second only to man as spreaders of infectious diseases to mankind. Animal parasites constitute a menace to human health; *Echinococcus granulosus* is perhaps the most dread of the intestinal group.

A letter printed in the *British Medical Journal,* April 4, 1953, p. 781, offers cogent remarks not far removed from our own situation in this country:

"Our city parks are playgrounds for infants. They also serve as excretory areas for many dogs. Though regulations have been made regarding the disposal of offal in abattoirs, little effort has been made to inform the public of the disease, the dangers of contact between children and pet dogs, the need for protective fencing of vegetable gardens and allotments, and the necessity for prompt detection and treatment of cestode disease in dogs. The appalling complacency amongst dog-owners regarding worm infestation is not surprising. As a father said not long ago in this hospital regarding his daughter of eight years, "She loves dogs and spends much of the day with them." Her cerebral symptoms were found to be due to an intracranial hydatid cyst the size of a golf ball."

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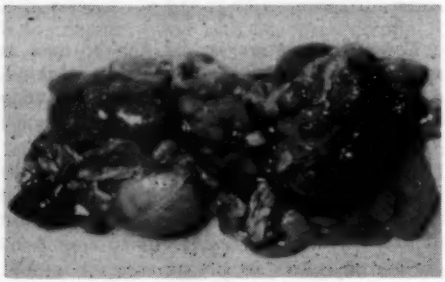
Fractures of the lower tibia, often difficult to fixate by external methods, can be handled by setting pins in the upper and middle tibial thirds in the conventional manner described by Stader. Thin lamellae of cotton can then be used to pad the foot, which is then wrapped with gauze, partially flexed and stabilized with a plaster cast. A wooden block, in which two pins have been set, is incorporated into the plaster cast. Clamps are then placed on all four pins, and a pin bar inserted to stabilize the lower leg. The method is also useful in lower tibial deformities in which osteotomy necessitates fixation.—*R. L. Rudy, D.V.M., Columbus, Ohio.*

Isolation of Listeria monocytogenes from Chinchillas

H. C. SMITH,* D.V.M., Sioux City, Iowa

Listeria monocytogenes infection in animals appears to be increasing. It has been isolated from man, horses, cattle, sheep, swine, chickens, rabbits, fox, goats, rodents, and



Visceral lesions include hemorrhages in heart and lungs, congestion of stomach and intestinal mucosa and enlargement of the spleen.

guinea pigs. On at least two previous occasions, it has been reported in chinchillas. Kennedy[1] first reported isolation in Canada in 1949 and Shalkop,[2] in 1950, from chinchillas sent to him from Virginia. Graham[3] presented an excellent chapter on listerellosis along with an up-to-date list of references. Gray and Moore[4] reported on use of some of the antibiotics in the treatment of sheep and cattle and list 46 references.

History. The infected chinchilla herd under consideration consisted of 150 adult breeding animals. Losses extended over a period of five months, and totaled 18 head. At last report, losses were continuing.

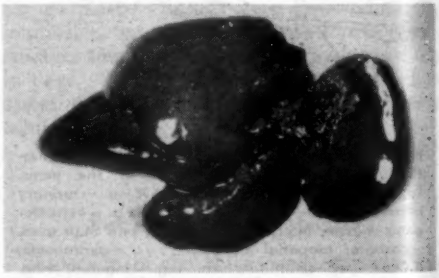
Symptoms. There are surprisingly few reports in literature on symptoms produced by this infection in chinchillas. Aside from sudden deaths as reported by caretakers, nothing of diagnostic importance was seen in these cases. Sick animals were observed crying, slobbering, holding the head to one side, and pawing at the ears. Nervousness, conjunctivitis, sneezing, sniffling, sudden twitching of the face, eyes, and particularly the ears were prevalent. All animals sick for several days lost considerable weight. There was no diarrhea at any time.

*Allied Laboratories, Inc.

Autopsy Findings. Opacity of the cornea was observed in three of all affected animals. Hearts and lungs were hemorrhagic, stomachs and intestines congested, and spleens enlarged. Outstanding lesions, and the most constant, were observed in livers. These contained small foci, grayish white, and from pinpoint to a small pea in size. Appearance of advanced lesions was typical, but early liver lesions were most difficult to find. Later, as the disease progressed in some animals, liver abscesses, larger than a pea, were found.

Cultural Findings. Cultures were made from hearts, lungs, brains, livers, spleens, and kidneys. After 24 hours of incubation, growth was secured from all of the tissues. Morphologically, organisms were small Gram-positive rods, arranged in pairs and short chains, with rounded ends; some demonstrated bipolar staining. Organisms were actively motile when grown at room temperature, sluggish to negative at 37 C., and produced acid from dextrose, lactose, dextrin, and glycerol. There was no action on maltose, sucrose, inositol, arabinose, xylose, or inulin. Hydrogen sulfide and indole were not produced. Nitrates were not reduced, while catalose was positive**.

Animal Inoculations. The organism proved pathogenic to mice in 1:100 dilution of broth culture, with gross changes found in spleens. It was fatal to rabbits in 48 to 96 hours when given intravenously as 0.2 cc. undiluted cul-



Small grayish-white foci in livers were the most constant autopsy lesions.

ture with gross lesions formed in the livers. Monocytes were 70% of the total white count in 48 hours.

Summary. A positive diagnosis of listeriosis in the chinchilla requires laboratory proce-

**The author wishes to thank Dr. R. A. Packer, professor, Veterinary Hygiene, Iowa State College, Ames, and Mr. Herbert Soule, bacteriologist, Pitman-Moore Co., Zionsville, Ind., for their work in confirming findings.

dures. Although there is no actual or accurate information available at this time as to extent of this disease in chinchillas, future findings should be reported in veterinary literature. Since man is also susceptible to this infection, care should be exercised in handling and particularly in postmortem examination of animals suspected of harboring Listeria.

REFERENCES

1. Kennedy, Raymond W., *Listeria monocytogenes* Infections in Chinchilla, Report of Ontario Veterinary College, 1949, p. 137.

2. Shalkop, W. T., *Listeria monocytogenes* Isolated from Chinchillas. *Jour. Am. Vet. Med. Assn.*, 116:447 (June), 1950.

3. Graham, Robert, Listerellosis, Diseases Transmitted from Animals to Man, ed. 3, Springfield, Ill., Charles C. Thomas, 1947, p. 159-178.

4. Gray, M. L., and Moore, G. R., Aureomycin in the Treatment of Ovine and Bovine Listeriosis with Notes on Survival. *N. Am. Vet.*, 34:99 (Feb.), 1953.

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Use of Antibiotics in Treatment of Actinomycosis

GEORGE A. PIPER, D.V.M., Viroqua, Wisconsin

Three Guernsey bulls, owned by a local artificial breeders' cooperative, were treated for actinomycosis with antibiotics. The first case was diagnosed actinomycotic infection of the tongue. A six-year-old bull was losing weight and appetite was poor. The tongue was noted to be approximately twice normal size so that swallowing was difficult. Treatment was begun immediately. The animal was given 2 gm. of terramycin intravenously each day for four days with two vials of dihydrocillin®[1] intramuscularly for four days. The bull responded and within a week after treatment appetite had improved. Two months later this patient had gained weight and breeding efficiency was improved.

The second case was a seven-year-old bull with a lump on its lower jaw the size of a large egg. It was diagnosed as actinomycosis. This animal was given 2 gm. terramycin intravenously each day for four days along with two vials of dihydrocillin intramuscularly for four days. The bone growth diminished to about half the original size in approximately a month. The pathogen has apparently been destroyed. The area was infiltrated once with a 3 cc. vial of combiotic®[2] in 20 cc. of water. This bull's semen was normal prior to treatment. Subsequently, it was of poor quality for two collections, one each week, and then returned to normal and has remained so.

The third case was a seven-year-old bull with swelling on the upper jaw. It had gone untreated for three years because the stud manager thought that it could not be treated without impairing fertility for a long period. The whole upper side of the maxilla was enlarged and swelling had abscessed twice previously but was now healed. The eye was affected and protruded from the socket. There was profuse lacrimation. The bull was eating and in normal service.

Treatment consisted of 2 gm. of terramycin and 20 cc. of dihydrocillin each day for five days. The last few days of treatment, combiotic was infiltrated locally, one vial in 50 cc. of saline, injected into the one soft spot of the abscess. It has been three months since the animal was treated and the swelling has reduced by half. The eye returned to normal within three weeks after treatment. Two services were not used after treatment because of the poor quality sperm, but subsequent semen has been of normal quality.

All of these animals have been observed weekly for four months since treatment and there has been no recurrence of infection.

[1]Upjohn Co., Kalamazoo, Mich.
[2]Chas. Pfizer and Co., Brooklyn, N. Y.

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Lumbar Epidural Anesthesia

ALBERT R. GREENWOOD, D.V.M.,
Claremont, New Hampshire

Paravertebral anesthesia has been used in our practice routinely for some time in rumenotomy of dairy cattle.

Russian workers† have reported use of a lumbar epidural block for this operation which we also have used successfully and which requires but one injection of 10 cc. of 4% procaine hydrochloride solution. Technic is as follows: A 16-gauge, one-inch needle is inserted just to the right of and about one-half inch posterior to the cranial border of the transverse process of the second lumbar vertebra at an angle of about ten degrees to the median plane. A 20-gauge, 4-inch needle is directed through this needle until the interarcuate ligament is felt and then inserted through this ligament for a distance of approximately one-quarter inch. The anesthetic agent is deposited in the epidural space of the lumbar region. Anesthesia develops promptly.

†Magda, I. I., Shalduga, N. E., and Voskoboinikov, V. M., Some Remarks in Connection with Rumenontomy. *Veterinariya*, 29:47 (Oct.), 1952. (Abs. *Jour. Am. Vet. Med. Assn.*, 122:328 [Apr.], 1953.)

New Procedures for Insuring Faster Growth Rate in Calves

JOHN T. FOLEY,* D.V.M., and ROBERT J. NUTTALL,* D.V.M, Cary, Illinois

For many years, it has been a recognized fact among dairymen that calves raised on nurse cows generally make faster gains than pail-fed calves[1]. In the past years, we, too, have observed that calves which are on nurse cows show better development than pail-fed calves which are segregated from adult animals and raised under strict sanitary conditions. Since our calves are raised under optimum conditions and fed on whole milk along with feed supplements, we believe this slower rate of growth to be due to a retarded development of rumen function, rather than lack of proper nutritional factors in the ration. The calves raised on nurse cows are in contact with adult animals and exposed to earlier and continuous inoculation with rumen organisms. Thus, they develop and maintain rumen function at an earlier age and make faster gains. This conclusion is in agreement with recent observations on the importance of early development of rumen function in calves[2].

It has been suggested by Pounden and coworkers[3] that calves could be inoculated by using fresh rumen material, but this has not proved practical in our operations. Obtaining rumen material in sufficient quantity for our operations presented quite a problem. "Stealing a cud" from a cow has been described as simple, but we have found it difficult to use routinely in large numbers of inoculations. Obviously, the use of material from a slaughter house is not advisable because of the possibilities of introducing disease. Recently there has been introduced a dried rumen product (bovinoc®) that greatly simplifies inoculation of young calves. It is stated that the product is produced from natural rumen material and is thoroughly tested to eliminate the danger of transferring disease organisms[4]. Because of the characteristics of this product, we have been able to practice rumen inoculation in all our calves.

On our farms, the calf is allowed to nurse its dam for five days to insure a liberal supply of colostrum. During this period the calf receives one teaspoonful of dried rumen material each day, which is placed on the back of the tongue. At the end of the five-day period, the calf is taken from its dam and fed twice a day from a nipple-pail. At this time, it is given one teaspoonful of the dried rumen material dissolved in the milk at each feeding. This supplemental "seeding process" is continued until the calf is three weeks of age. At the time the calf is transferred from the dam, it is fed a grain mixture in its own individual feeder and has access to clean legume hay and clean water at all times.

At the time of writing this article, we have used this method on approximately 125 Holstein, Jersey, Guernsey, Ayrshire, and Brown Swiss calves, and have observed that they begin eating hay and grain at an earlier age. Rumen function is initiated earlier — many of the calves have been observed ruminating and chewing their cud as early as ten days to two weeks of age. Average growth weights have been equal to or have exceeded the Ragsdale standards given in the accompanying table. Calves which receive such rumen inoculations are thriftier and appear to have a greater resistance to calfhood diseases, including the respiratory infections. Diarrheas, which develop in inoculated calves, appear to be milder and show quicker response to treatment than those in calves which have not been inoculated.

Because of these results, we have used the dried rumen culture at the recommended dosage in older calves which were not making satisfactory growth, believing that the dried rumen culture would re-establish normal rumen flora for proper digestion and assimilation. This was verified because these calves have shown a noticeable improvement in growth rate and general thriftiness.

*Curtiss Candy Farms, Cary, Ill.
®Ft. Dodge Laboratories, Ft. Dodge, Iowa.

Normal Body Weight and Heart Girth of Females During the Growing Period.

Age in months	Ayrshire Weight lb.	Ayrshire Girth inches	Guernsey Weight lb.	Guernsey Girth inches	Holstein Weight lb.	Holstein Girth inches	Jersey Weight lb.	Jersey Girth inches
Birth	72	29	65	28	90	31	53	27
1	89	31	77	30	112	34	67	30
2	119	34	102	34	148	37	90	33
3	158	38	133	36	193	40	121	35
4	198	41	173	39	243	43	158	38

In conclusion, dried rumen material has been found to be a safe, convenient, and effective method for earlier inoculation of the rumen in young calves and re-establishment of the natural flora in older calves for faster growth and production of healthier, thriftier animals.

REFERENCES

1. Herman, H. A., Raising the Dairy Calf. Bul. 377, Univ. of Mo. Agric. Exp. Sta., 1949.

2. Pounden, W. D., Rumen Function and Health in Young Calves. Proc. 89th Ann. Mtg., Am. Vet. Med. Assn., 1952.

3. Pounden, W. D., and Hibbs, J. W., Rumen Inoculations in Young Calves. *Jour. Am. Vet. Med. Assn.*, 114:33, 1949.

4. Hancock, B. B., and Edds, G. T., Correction of Rumen Dysfunction. *Bio-Chemic Review*, 23:20, 1952.

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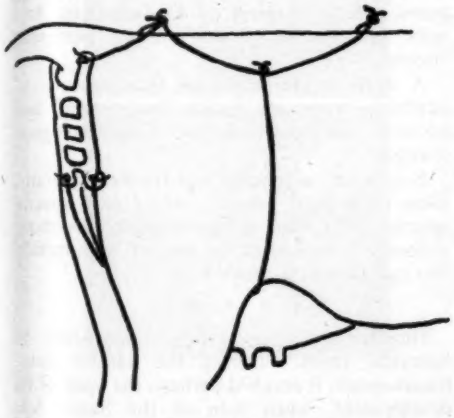
Retention Device to Prevent Recurrence of Bovine Uterine Prolapse

KEITH T. MADDY, D.V.M., Berkeley, California

There are few things more discouraging in bovine therapy than to spend valuable time in replacing a prolapsed uterus and then to be called because sutures have not held, the rope truss slipped, and the prolapse recurred. While it is common practice to place several

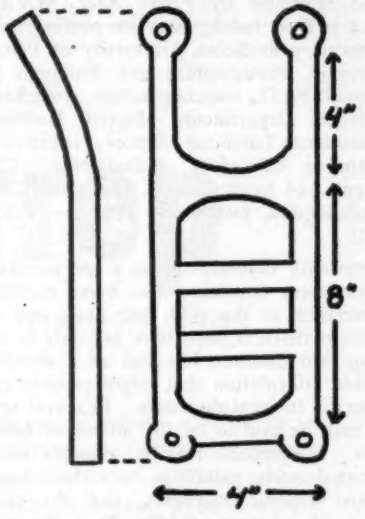


Application of the truss.

heavy tape sutures deep in the perivulvar tissue to retain the uterus, resulting irritation and pain are perhaps causes of straining, resulting in recurrence of prolapse.

The rope truss of Rainard usually is applied effectively, but even though the ropes are kept tight, prolapse sometimes occurs because they are not wide enough to cover the entire vulvar area.

The author designed, and instructed a welder to make, a steel truss which, when held in place with ropes, gives excellent results. It covers the entire vulvar area and prevents the uterus from prolapsing past the edges as it sometimes does with the rope truss. The top-



Details of the truss.

most part consists of a steel "U" with side arms four inches long which go under the base of the tail. The bottom of the truss is an oval ring four inches wide and eight inches long with two transverse bars. Four rings are welded to the corners of the truss for attachment of ropes. The apparatus is curved so that the top fits well forward around the base of the tail.

Construction of the truss and method of application are illustrated in the accompanying drawings.

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Blue-Tail lizards, common in Southern Florida, often cause neurological symptoms when eaten by cats. This is presumed to be due to the presence of a neurotoxin, which causes inappetance, pain, nervousness, staggering, salivation, and vomition. The head may be twisted to the side, and untreated animals may die in two to four days. Treatment consists of removal of the offending material by oral purgatives, emetics, or enemata, and control of secondary invaders with antibiotics. Dogs are not affected. *Auburn Vet.*, 9:75 (Winter), 1953.

BOOK REVIEWS

Books reviewed in this department and any other books, if available, may be obtained by remitting the published price to the Book Department, Veterinary Medicine, Suite 803 Livestock Exchange Building, Kansas City 2, Missouri.

VETERINARY DERMATOLOGY. A text and reference by *Frank Kral,* M.V.D. (h.c.), Doc. habil., associate professor of veterinary medicine, University of Pennsylvania, Philadelphia; and *Benjamin J. Novak,* Ed.D., associate author, chairman, Science Department, Murrell Dobbins Vocational-Technical School; lecturer, Temple University, Philadelphia. 325 pages, 124 figures. J. B. Lippincott Co., Philadelphia, publishers, 1953. — Price $10.

Veterinary dermatology as a special branch of veterinary medicine has been neglected. Examination of the skin, hair coat, and subcutaneous tissue is important, not only in diagnosing skin diseases, but also as a source of valuable information that might provide clues to specific internal disorders. In a real sense, skin may be said to be the mirror of general health. Integument reflects changes closely associated with pathology in other organs, various systemic disorders, and the consequences of deficient nutrition. Thus, the axiom in human medicine: To know dermatology is to know all medicine.

This is the first complete book on veterinary dermatology published in the English language. The author of this work wrote Veterinarni Dermatologie, which was published at Brno, Czechoslovakia, in 1931. The excellence of this former text, as well as articles subsequently published in American journals (such as in *Vet. Med.,* 48:172;185 [May], 1953) bear testimony to the caliber of Doctor Kral's work. The present book is something more than a translation of the previous work, incorporating information contained in the original book along with recent advances in dermatology.

Divided into 21 chapters, the book begins with chapters dedicated to basic survey, skin examination, etiology, and classification of skin diseases. Subsequent chapters consider every phase of animal skin disease: inflammation, eczema, otitis externa in dogs, urticaria, food rashes, photosensitization, etc., in all classes of animals. Those accustomed to reading fragmentary and sporadic considerations in journals or texts will find here, for the first time, a complete dermatology with copious references. Each disease is considered; its synonyms, symptoms, etiology, differentiating features, diagnosis, prescriptions, and therapy are completely, but not exhaustingly, covered. Many excellent pictures illustrate skin lesions in all classes of animals.

Veterinary Dermatology is recommended without reservation. It is certain to provide useful information to practitioners.

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MAN'S FOODS. A text by *Lloyd B. Jensen, Ph.D.,* chief bacteriologist, Swift and Company, Chicago. 288 pages, many charts. The Garrard Press, Champaign, Ill.—Price $4.50.

Man's Foods commands the attention of those interested in bromatology from an evolutional view. The book considers nutrilites in prehistoric eras when man was concerned with food gathering rather than food producing. Many interesting concoctions and archaic culinary practices are uncovered, as are pertinent archeological facts.

Part two considers man in food-producing times. Here, chapters on Domesticated Animals and Protein Foods are of particular interest.

A third section describes the influence of nutrients on man's social development and welfare, and their relation to morphological changes.

Not strictly a specific text for veterinarians, some parts hold general, others only special interest. The book is recommended for those seriously interested in the history of nutrition and its relation to man's food.

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Hippophagy (horse-eating) flourished in historical times. During the ancient Solutreans epoch, it reached perhaps the apex of its development, when men of the Stone Age drove large herds of horses over cliffs to destruction. Enormous collections of bones bear testimony to these practices. In one area, there are prehistoric remains of over 100,000 horses. That these people existed as long as they did is indicative of the nutritive value of their diet. Horse flesh is rich in minerals, vitamins, and glycogen; not as rich in thiamine as pork.—*From Man's Foods.*

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(STREPTOMYCIN SULFATE ORAL VETERINARY, MERCK)

VetStrep, soluble granules of streptomycin, offers the advantages of efficiency, economy, and ease of administration. These granules dissolve readily in drinking water or milk.

VetStrep contains streptomycin, proved effective against both primary and secondary organisms most often responsible for enteritis in hogs, calves, dogs, and quail.

Extensive field trials have demonstrated that VETSTREP often clears up *swine enteritis* and *calf scours* in as little as one day. A summary of these studies is available on request.

VetStrep is packaged in convenient sizes available to veterinarians through their usual sources of supply.

SUPPLIED:
In screw-cap bottles of 15 Gm., 75 Gm., and 750 Gm.

Research and Production for Better Animal Health

MERCK & CO., INC.
Manufacturing Chemists
RAHWAY, NEW JERSEY

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ITEMS OF VETERINARY INTEREST

There is no wrong way to treat fractures so long as successful results follow thoughtful effort.

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In Colorado feed lots, calf diphtheria is a serious secondary infection to the common shipping fever complex that is responsible for significant death losses.

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Canadian workers (*Can. Jour. Pub. Health*, 44:25 [Jan.], 1953) have isolated a new virus from ducks exhibiting symptoms of paralysis and sinusitis. The agent is not Newcastle disease virus.

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In South Africa, the tick *Boophilus decoloratus* was found to be resistant to BHC. DDT and toxaphene were effective, although chlordane was not.

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Some practitioners in the Corn Belt are reported to have discontinued entirely the use of live virus for immunization of swine for hog cholera.

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Mixed feeds containing small amounts of animal and fish products as protein supplements supply less than the amounts of salt considered optimum requirements for all classes of livestock and poultry.

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Control of parasitic diseases is dependent upon the intelligent use of anthelmintics and the application of preventive measures suggested by thorough acquaintance with the life history of the specific parasite identified.

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In the near future, poultrymen may engage veterinary services on a cooperative basis. Guaranteed sufficient minimums of salary and chance for advancement, young veterinarians may well enter intensive poultry practice.

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The synthetic milk system of pig feeding is generally not as economical as the conventional one. When less expensive ingredients are used, and labor costs cut, it will probably replace the other system. Therein lies promise of a steadier supply of pork.

Infected teeth may be responsible for cataract.

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A new formulation of warfarin makes it doubly effective as a poison. It is now soluble in water.

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Despite glowing reports of the efficacy of steroids in neoplasia subsidence, there is no known steroid that can control growth of all tumors.

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Ewes affected with blue tongue often lose 30% or more weight in two weeks of illness. Those that recover are reported to regain lost weight rapidly.

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There appears to be little or no correlation between the mineral content of summer milk and that of pasture herbage.—*Ohio Agr. Exp. Sta. Cir. 13.*

▼

In 1951, 72,000 dead hogs were delivered at the nation's livestock markets, many having died from overheating and underventilation during transit.—*Livestock Conservation, Inc.*

▼

Lagerlof and Boyd, in examining the genital organs of 6,286 cattle at autopsy, found that 7.2 to 11% exhibited total ovarian hypoplasia, 6% involving the right ovary and 3.2% the left, evidencing cystic degeneration. Double cervices were noted in 2%.

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To accept the belief that valuable medical information may be gained only by scientists trained, equipped, and paid to conduct research is to perpetuate a misconception. Much useful material has resulted from the findings and observations of general practitioners in the field.

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According to a recently compiled report, 344,466 calves were vaccinated with strain 19 Brucella vaccine in California during 1952. This is approximately 9% above the total vaccinated a year earlier.

California owners may have their calves vaccinated without cost by requesting such service of their local practitioner.